

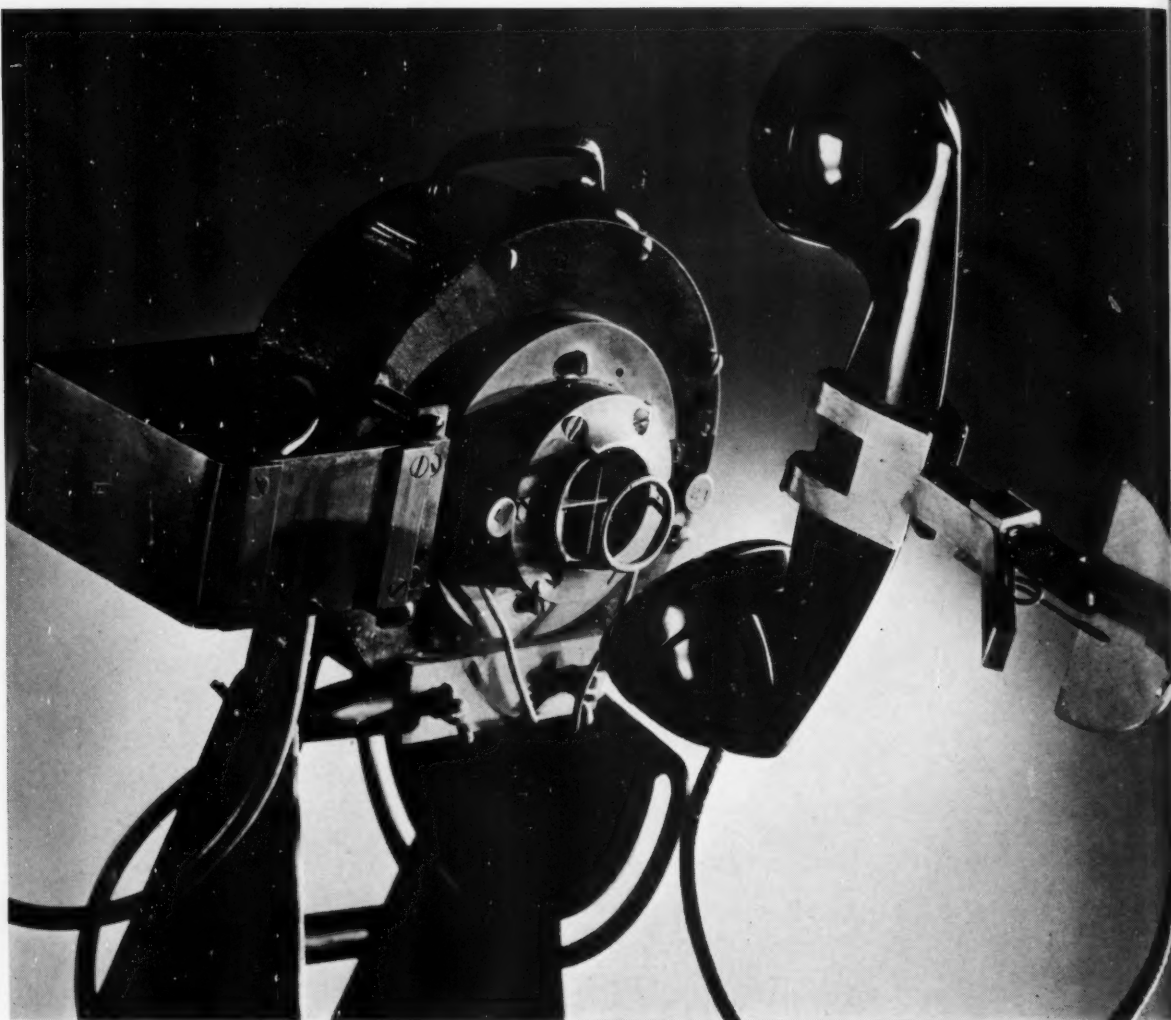
AMERICAN

FORESTS



JANUARY 1941

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SAID THE ELECTRICAL MOUTH TO THE ELECTRICAL EAR...

*"Joe took father's shoe bench out.
She was waiting at my lawn."*

If you were passing through the Bell Telephone Laboratories today you might hear an electrical mouth speaking this odd talk, or whistling a series of musical notes, to a telephone transmitter.

This mouth can be made to repeat these sounds without variation. Every new telephone transmitter is tested by this mouth before it receives a laboratory or manufacturing O.K. for your use.

This is only one of the many tests to which telephone equipment is subjected in the Bell Telephone Laboratories. And there is a reason for the selection of those particular words.

It happens that the sentence, "Joe took father's shoe bench out," and its more lyrical companion, "She was waiting at my lawn," contain all the fundamental sounds of the English language that contribute to the intensity of sound in speech.

Busily at work in the interest of every one who uses the telephone is one of the largest laboratories in the world. The development of the telephone in this country is proof of the value of this research. In times like these, the work of the Bell Telephone Laboratories is especially important.

BELL TELEPHONE SYSTEM

*The Bell System is doing its
part in the country's program
of National Defense*



AMERICAN FORESTS

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Published monthly by

THE AMERICAN FORESTRY ASSOCIATION

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The American Forestry Association is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute in the highest degree to the welfare of the nation and its people.

In addition to publication of two magazines—**AMERICAN FORESTS** and **CONSERVATION**, both designed to keep before the people of the country important conservation questions and issues, the Association carries on educational projects in various fields including forest fire prevention, reforestation, protection of fish and wildlife, upstream flood control, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, development of forestry by private endeavor, the teaching of conservation in the schools of the country, promotion of research in timber growing and use and expansion of markets for forest products.

The Association is independent. It has no connection with any federal or state governments. It is non-political and non-commercial. All its resources and income are devoted to the advancement of conservation. It has been so operated since its founding in 1875. All citizens interested in forestry and conservation are eligible for membership.

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BIG TREES

The American Forestry Association is sponsoring a national hunt for the discovery and preservation of the largest specimens of the different species of typical American trees. Locate, measure and nominate your candidate in this competition. ACT NOW to make known and save the largest specimens of America's trees. For further details, see page 412 of the September issue or send for special announcement of this Big Tree hunt. Mail your nominations with records and pictures to The American Forestry Association, 919 17th Street, Northwest, Washington, D. C.

Can You Match This Live Oak?

NOMINATED as the world's largest live oak by Charles Genella, of New Orleans, this is one "president" with no executive troubles, for it is the President of the Live Oak Society, the members of which are all trees! Under the constitution and by-laws of this unique society, a representative, either the owner of the tree or some other interested person, is designated as attorney for each member.

The annual dues are twenty-five acorns from each tree, payable on or about each New Year's day. The "dues" are planted along the Old Spanish Trail Highway between Lafayette and New Orleans, Louisiana. Although a distance of only 170 miles, there are more than 5,000 live oaks in sight of the roadway.

Big oaks from little acorns grow! True—but it's hard to believe that this giant tree in Hahnville, some thirty miles northwest of New Orleans, grew from anything but a giant acorn. It is 178 feet high, has a spread of 168 feet and is thirty-five feet around. The tree is so old (it started growing a hundred years before the American Revolution) that iron pipes are used to keep the huge branches from tumbling

down. People living in Hahnville are proud of the tree and are frequently at work filling in cavities and patching up soft spots in the body and branches.



The Giant Live Oak at Hahnville, Louisiana, not far from New Orleans

NEW FOREST SERVICE ROADS...

Let them START and END Here!

FROM start to finish, from bank to bank, without calling for help! That's the kind of road-building job you can get with a "Caterpillar" Diesel Motor Grader. In short — a *complete, one-machine job!* For there's power, traction and weight in this outfit to beat the tough, heavy going you buck up against on your first break-through. There's every blade-position you need — quickly attained through time-and-labor-saving power-controls. And while a "Caterpillar" Diesel Motor Grader delivers enough heavy-hitting drive for roughing-out, it's equally efficient on the lighter, finishing tasks: grading surfaces to a chalk-line, spreading gravel or oil mix, giving shoulders and banks their final trim.

Companion to this rig is the "Caterpillar" Diesel Tractor—teamed-up with bulldozers or carrying-type scrapers for the earth-moving work frequently encountered in an extensive road-building program. Powerful and sure-footed, sparing with inexpensive fuel—as the "Caterpillar" Diesel Motor Grader is also — these tractors offer economy, stamina and steady pace for low-cost yardage!

There are three sizes of motor graders, five sizes of tractors... a wide range of power and job versatility. Here is the place — in the "Caterpillar" Diesel line—for the new Forest Service roads to start and end!

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GEORGE O. VASS

GEORGE O. VASS, Treasurer of The American Forestry Association and, *ex-officio*, a member of the Board, was elected in 1924. His enthusiastic interest in and support of the work of the Association through these sixteen years has been unflagging, and his zeal and ability in guiding and directing the affairs of the organization as its ranking financial officer are definitely reflected in its strengthened position today.

Mr. Vass is a product of the West. He was born at Santa Cruz, California, May 2, 1880—in the shadow of the redwoods. And so, since his early life was permeated

OUR DIRECTORS

with the atmosphere of these greatest of trees, it is natural that his interest still turns to the forest and the world of outdoors,—though his chief activities today lie with banks and bankers.

When he was nine years old his family moved to Boise, Idaho, and lived there through his public and high school days. When he was seventeen, he came to Washington to prepare for college and entered Emerson Institute and then, after a year, decided to take up law. He entered George Washington University, was graduated with a law degree in 1902 and admitted to the bar the same year. Instead of going actively into law practice, however, he entered Riggs National Bank in 1903 as national bank agent for country banks. In 1918 he became directly connected with the Riggs Bank as assistant cashier and two years later was elected a vice-president. In 1905 he was made cashier, and at the present time is vice-president and secretary of the Board of Directors. Proving that he is a woods-minded outdoorsman although a banker, his hobbies are chasing ducks with a walnut-stocked gun and golf balls with a persimmon-headed club!

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Goodwin Beach, 1944—Connecticut—Connecticut Forest and Park Association

F. W. Besley, 1940—Maryland—State Forester of Maryland

P. B. Camp, 1940—Virginia—Camp Manufacturing Company

Samuel T. Dams, 1942—Michigan—School of Forestry and Conservation, University of Michigan

Karl T. Frederick, 1941—New York—New York State Conservation Council

Henry S. Graves, 1941—Connecticut—Yale School of Forestry

William B. Greeley, 1943—Washington—West Coast Lumbermen's Association

A. S. Houghton, 1944—New York—State Reforestation Commission

L. F. Livingston, 1944—Delaware—American Society of Agricultural Engineers

John C. Merriam, 1941—District of Columbia—Carnegie Institution of Washington

Joseph Hyde Pratt, 1943—North Carolina—Forestry Association

Wilbur K. Thomas, 1943—Pennsylvania—Carl Schurz Memorial Foundation

John W. Watsek, Jr., 1940—Illinois—National Lumber Manufacturers Association

Vanderbilt Webb, 1942—New York—New York Forestry Association

William P. Wharton, 1942—Massachusetts—National Association of Audubon Societies



THE wish being father to the thought, it is appropriate here to record, in this January 1941 issue of *AMERICAN FORESTS*, the editors' cordial wish for a Happy New Year to all readers and especially to those who, as members of The American Forestry Association, are by the same badge members of the editorial family.

To you, wherever you may be, we would have you know that our wish this year is quickened by the conscience that we are exercising a privilege today denied to many. It is the privilege of saying Happy New Year with the knowledge that this wish is meaningful and carries promises of fulfillment, because we here in America are especially blessed with those things that make happiness possible—peace, freedom, resources and opportunities. May we all hold fast to them. And by our honorable actions, our good-will one to another, our united purpose throughout the year, may we next January 1 be able again to say "Happy New Year" with the same knowledge that our pillars of happiness still stand firm.

Over 2,500 new members joined The American Forestry Association during 1940. Among them are an unusual number of well-known people. To mention a few: Edward Everett Horton, "Believe it or Not" Robert Ripley, Senator Guy Gillette, Edgar Bergen of Charlie McCarthy fame, Walter Lippmann, Fritz Reiner (Director of the Pittsburgh Symphony Orchestra), Rexford G. Tugwell, Yehudi Menuhin, violinist.

Of our 1940 new members, sixteen enrolled as life members. They are: C. E. Blanco, Mexico; Edna H. Cahoon, New York; Norman Dwight Harris, Florida; Albert A. Jackson, Pennsylvania; Keith L. Davey, California; Kate Cary, Massachusetts; Mrs. G. Lister Carlisle, Connecticut; Mrs. William Amory, Massachusetts; J. Thompson Brown, Delaware; H. M. Lucas, Ohio; L. G. Parker, Ohio; Mrs. William A. Parker, Massachusetts; Robert W. Davisson, Georgia; Lessing J. Rosenwald, Pennsylvania; Mrs. Joseph M. Cudahy, Illinois, and S. Elliott Stearns, California.

Carl Eppert, noted symphonic composer of Wisconsin, has written a forest symphony entitled "TIMBER," which is now being made ready for presentation by symphony orchestras in Chicago, Philadelphia and other large cities. The composition is in three parts: the first giving musical expression to the birth and growth of trees and forests; the second to the peace and tranquillity of a primitive forest before the advent of man; the third to the coming of man, the destruction of trees by his hands and finally a grand coda expressing the regeneration of the forest.

Back of Mr. Eppert's work is an interesting story. Several summers ago the composer sought nature in the mountains of Montana and lived close to it in a cabin where he had an opportunity to see and learn forest conservation as carried out in the national forests. He became so inspired by his vision of a renewed America through reforestation that he dedicated himself to the writing of a symphony that would carry the message to the whole country.

But when he completed the work and returned to Wisconsin, there was no money for the preparation of the score and the orchestral parts without which it could not be made available for orchestra rendition. Mrs. Edward La Budde, a former vice-president of The American Forestry Association and long active in conservation in Wisconsin, called the need of funds to the attention of The American Forestry Association which undertook to raise the amount required from some of its music-loving members. Among them was Mrs. John Erskine of Wilton, Connecticut, whose distinguished husband is chairman of the board of the Julliard School of Music. A few days ago the editor received from Mr. Oscar Wagner, dean of the School, a letter saying that the conductor's score and the orchestral parts of "TIMBER" are now being prepared by an award made by the Julliard School of Music. So watch for "TIMBER" on your orchestra programs.

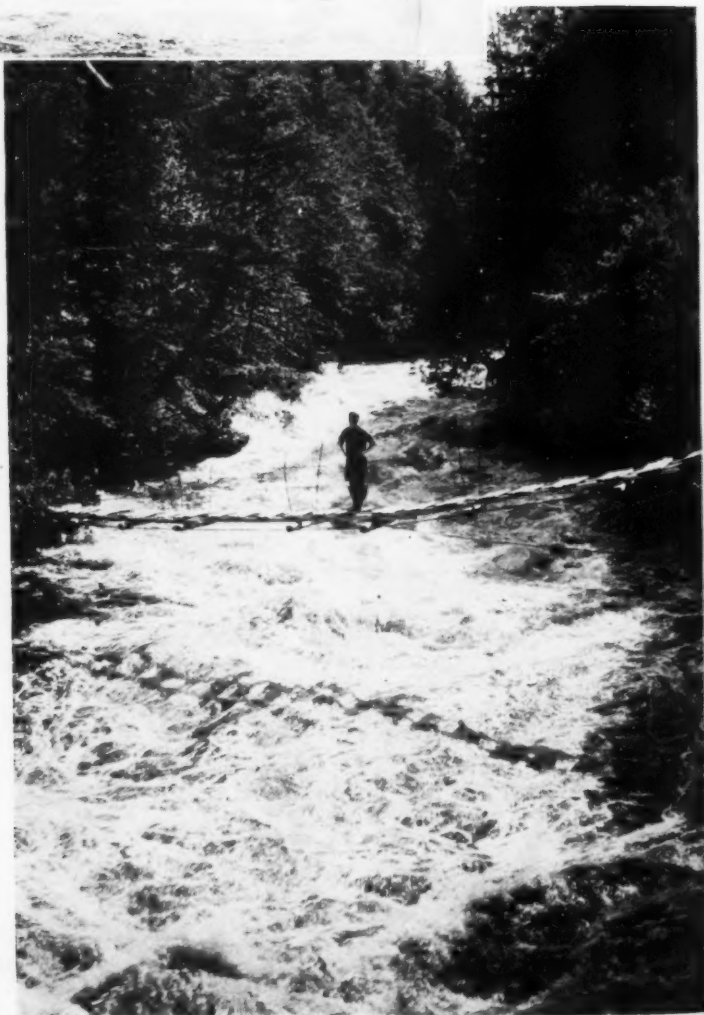
Orin Rusten
Editor.



The mighty Presque Isle, named by the early French explorers, plunges over beautiful falls as it thunders on its way to Lake Superior

CAN IT HAPPEN AGAIN—THE RAPE OF MICHIGAN'S FORESTS?

A rude suspension bridge spans one of the reaches of the Presque Isle,—built for the use of hunters and fishermen in this wilderness paradise



Porcupine Wilderness

A Call to Guard This Rugged, Untouched Wilderness on the Shores of Lake Superior, Where Stands the Largest Virgin Hardwood Forest Left to the Nation

By BEN EAST

THERE are those who will tell you that Americans don't repeat the mistakes of the past. I wonder!

In the summer of 1865, when the disbanded armies of the Blue and the Gray were straggling homeward along dusty roads, one of the finest pine forests then in existence on the North American continent blanketed the northern half of the mitten-shaped wedge of land between Lake Michigan and Lake Huron that is the Lower Peninsula of Michigan. It stretched in an almost unbroken blanket, this stand of white pine, from the valleys of the Grand and the Saginaw Rivers, northward two hundred miles to the Straits of Mackinaw. It shut out the full light of the sun from 12,000,000 acres of land.

The early lumber barons who began the harvest of that timber—a crop it had taken two patient centuries and more to grow—predicted with boisterous confidence that

there was enough white pine in Michigan to last the world forever. I reckon they believed it. Well, the axes rang in the snowy woods, and yellow lumber mounted in giant piles along the banks of the Saginaw and the Grand, the Muskegon and the Manistee, the AuSable and many another river.

The towns and villages that spread across the prairie-lands were built with Michigan pine. Chicago burned in 1871 and pine from the roaring mills across Lake Michigan to the east went into its rebuilding. Today, of the virgin pine that was to last the world forever, there remains south of the Straits of Mackinac two eighty-acre

Tall pines stand guard over Lake-of-the-Clouds, lying like a silver platter in a craterlike bowl of green hills



tracts. One stand is in the Hartwick Pines State Park near Grayling, the other not far from Interlochen.

In the span of one man's life the harvest of the pine was finished. The first sun of the new century, rolling above the eastern rim of the pinelands on the morning of January 1, 1900, reddened 12,000,000 acres of desolation where the pine had stood, 12,000,000 acres of fire-charred stumps, dotted here and there with the crumbling sills of ghost towns. County after county in the pine country was bankrupt, whether it knew it or not.

On the heels of the logging crews fires had run unchecked summer after summer through the tangled, sun-dried pine slashings. They "burned Michigan over" annually in those years, until the scant fertility that lay at the surface of the sandy land was gone. When the job was done millions of acres were left naked of any merchantable crop for a half century to come.

Only within the last decade or two has sane management of this vast area of idle land—coupled with a lusty young recreational industry that is founded on the combination of forests and water and that now trails second only to the automotive industry on the list of Michigan's wealth producers—begun to take up the economic slack and relieve the destitution that resulted.

It's an incredible story, the story of the pine harvest. But it happened, and it can happen again. What's more significant, apparently it's going to.

Today the largest tract of virgin hardwood forest remaining in the United States is located within the borders of the same state that once had enough white pine to last the world forever. That's sort of surprising in itself. But it's true. The biggest block of virgin hardwood left within our borders, according to the United States Forest Service, lies on the south shore of Lake Superior, in the western end of the Upper Peninsula of Michigan, just east of the Wisconsin border. It blankets the Porcupine Mountains and considerable wild and tumbled country around them.

And unless something is done about it, and done soon, this tract of hardwood is destined to go the way the pine went seventy-five years ago—down to the hungry mills to the last stick, with never a thought for the generation that will live among the stumps or for how it shall make its living.

The Porcupine Mountains, where this forest grows, are the highest range between the Black Hills of Dakota and the Adirondacks of New York. They shoulder their way abruptly up from the Lake Superior shore in rugged, tangled terraces. Their blue-hazed peaks rise 2,023 feet above sea level, 1,421 feet above the broad plain of Superior, mightiest of the world's fresh-water seas. And their slopes are clad, mile upon mile, ridge upon ridge, valley after valley, with open parklike forests that have never known ax or fire. Maple and beech, birch and hemlock, some oak and here and there a scattered growth of lofty, green-crowned pine.

The Porcupine country is today as it was in the beginning, an untouched roadless wilderness. And it has more than trees. It has beauty to take your breath away. Lonely lakes lie hidden in the deep-walled valleys, lakes that do not know the dip of a paddle blade from one year's end to another. Brawling mountain rivers, wild, dark and rock-shattered, go roaring down to Lake Superior through steep-walled gorges, dropping over ledges in countless mist-hung waterfalls.

Take the Black River of Gogebic County, for example. The valley of the Black lies at the western fringe of the Porcupine forest, in the shadow of the long ridge known as Copper Peak. Highways end at the Black. A county road winds down its valley, through the vir-

gin hardwood, dropping steadily as the river drops on its way from the rugged uplands down to Lake Superior. At the mouth of the Black the road ends. From that point to Lake of the Clouds, twenty-five miles to the east along the Superior shore, no highway comes within a dozen miles of Superior. The virgin forest runs back from the lake like a lush green carpet laid down on the rugged Porcupine ranges. Travelers who penetrate that wilderness must go afoot. The rivers are too wild and rock-broken for canoe travel.

In its last ten miles the Black plunges over four ledges to form a series of the most beautiful waterfalls along the south shore of Lake Superior. At the first falls, the Great Conglomerate, a rocky island splits the river into two channels and the dark water goes hammering down through two long chutes, one on either side. At the second falls the river makes an abrupt drop of thirty or forty feet into a pool where it boils and eddies under a curtain of rainbow-decked spray, finally surging out between pine-crowned walls that let no more than a couple of hours of sunlight touch the water at midday. That is Gorge Falls. The third and fourth falls, Sandstone and Rainbow, are less spectacular but hardly less beautiful.

Between the four falls and above and below them the Black plunges and roars down its bed in a thundering succession of steps and rock-shattered rapids. And on either side the gorge soars up into the sky, decked with dark pines and hemlocks. The road parallels the river all the way down the gorge at a distance of a quarter mile to a half mile, and well developed trails lead down from the road to each of the waterfalls. On the opposite side of the road Copper Peak frowns down, the highest hill in the district west of the Porcupines, a lofty landmark that looms, smoke-blue with distance, on the western skyline for visitors who stand above Lake of the Clouds in the heart of the Porcupine ranges, twenty-five miles away.

Whatever claims the Black may make to wild beauty, however, it is no more than a curtain raiser for the mighty Presque Isle that thunders into Lake Superior five miles to the east.

The Presque Isle was named by the early French explorers who voyaged along the south shore of Lake Superior. The name translates out of their language "almost an island." The visitor who lands at the mouth of this wild and lonely river quickly discovers the reason for the picturesque name.

A small timbered island blocks the Presque Isle at its mouth, dividing it into two channels. But it isn't an island the year around. Once the freshets of spring have thundered down their rocky chutes into Superior and the river has receded to its normal summer levels and its more tranquil summer ways, the eastern channel becomes a dry bed and the visitor can cross over on a ledge of smooth rock that has been worn and polished by the waters of countless springs. It is only in the flood time of April, May and early June that the bit of land in midriver becomes a true island.

For many miles above its mouth the river comes down a steep-walled canyon, raging through endless rapids, plunging over beautiful falls, swirling and foaming around tables, shelves and steps of red sandstone. It cuts through the heart of the roadless forest along the western shoulders of the Porcupines, and because its valley is roadless few persons have ever followed it the last ten or twelve miles of its wild way to Superior.

It's no canoe road, the Presque Isle. Its bed is floored with rock and it comes down from the uplands in a welter in which no canoe could hope to live.

As a matter of fact, few visitors have ever seen the Presque Isle, even at its mouth. From the end of the road at the mouth of the Black they must travel afoot or by boat along the Superior shore. Deep ravines filled with fallen timber cut the high clay banks at frequent intervals all the way between the two rivers, making the trip afoot one that even experienced hikers shun. And for one reason or another not many have bothered to go by boat.

But the Presque Isle will not be a roadless river much longer. The work of surveying a county highway was begun in the summer of 1940. The road will come down along the river gorge and in a few more years it will make accessible some of the finest scenic beauty of the Midwest.

Fifteen miles to the east of the Presque Isle as the

The valley is really a flat, gently sloping tableland, buttressed on either side by lofty ridges. At the far end of this tableland, ten or fifteen miles in the west, the visitor will catch on a sunny day the shine of distant water. That will be Lake Superior, off the mouth of the Carp. And still farther in the west a blue hill rises on the skyline. That is Copper Peak, beyond the valley of the Black.

At the visitor's feet, far below, lies Lake of the Clouds itself, a great silver platter in a craterlike bowl of green hills. On three sides the timbered mountains hem it in. On the fourth side, where the trail runs and the visitor will stand, a wall of rock rises sheer as the side of a house, hundreds of feet from the floor of the valley. Along the rim of the cliff a few clumps of pines mount their century-old guard.



There are few rivers in the midlands of this country as completely wild and isolated as the Carp, cutting its way through miles of roadless forest

raven flies, hidden among the green, timbered ramparts of the Porcupines, is the best known and perhaps the most beautiful spot in all that wild and beautiful mountain country, Lake of the Clouds. The visitor who stands at the top of the sheer cliff running along the north side of the lake looks out in three directions upon breathtaking wilderness beauty.

To the east he can look up the valley of the Carp River, a tiny stream winding like a silver ribbon far below him, and across the mountain ranges to the level land that lies beyond. To the south he can look across the lofty green ridges of the mountains to a tree-crowned knob higher than all the others. That is Government Peak, highest land between the Adirondacks and the Black Hills. To the west he can look down the wide valley of the Carp, flowing out of the western end of the lake. The river itself he cannot see. It is lost in the timbered valley.

One thing may trouble the visitor. That is the name of Carp for the little river that feeds and drains Lake of the Clouds. If he knows the clear cold waters of the Lake Superior country he will surmise that no carp has ever been within a hundred miles of that boisterous mountain stream. And he will be right in his surmise.

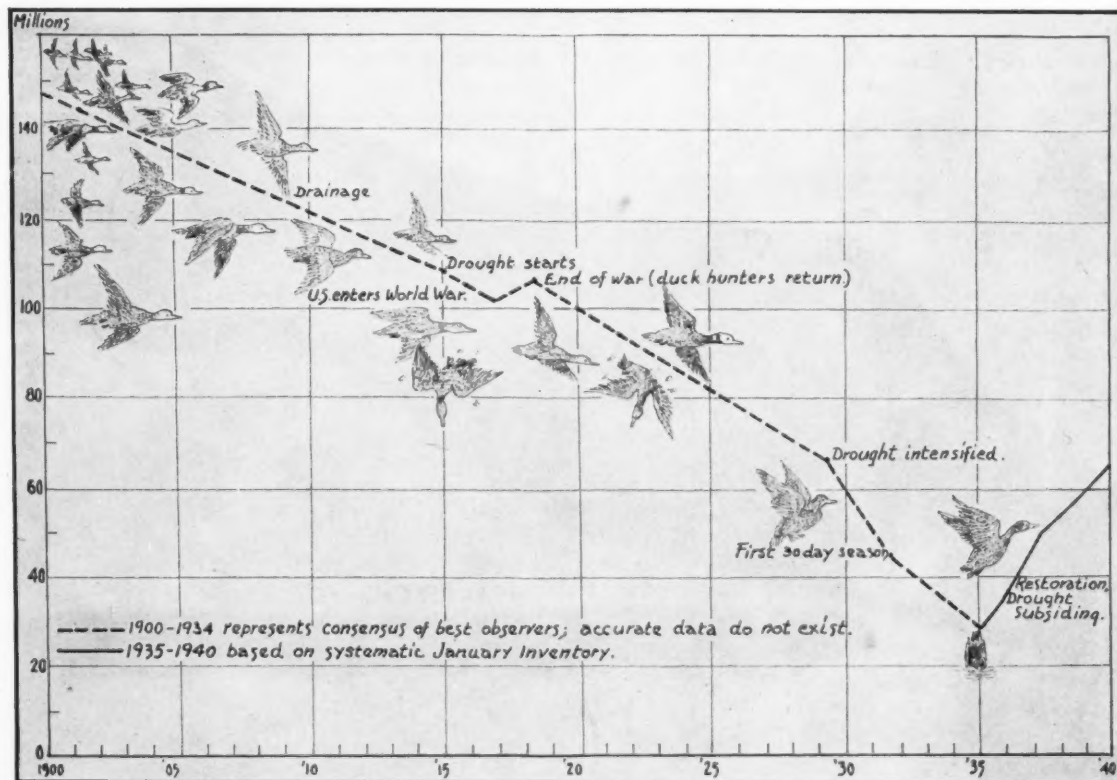
It would please him to know the story of the name and how the river came by it. Close to a century ago, when the copper mining industry of Lake Superior was a newborn infant, a group of Cornish miners, newly arrived from their native Wales, stood atop the rock wall above the valley and bestowed the name of Escarpment on lake and river alike. From Escarpment the name "Scarp" evolved, and later those who had neither knowledge of nor regard for geology corrupted it to Carp. From this undeserved title the lake was rescued a few years back.

(Continuing on page 46)

RECUPERATING AMERICANS

Protective Legislation and Proper Management Are Proving a Good Tonic for Wildfowl Population and Big Game Animals, Now on Increase

By LOGAN J. BENNETT



As shown by the chart above, the American waterfowl population though dropping from 140,000,000 birds to 27,000,000 in the short span of thirty-five years, is now definitely on the increase due to a continental program of restoration and changing weather conditions. The 1940 inventory reveals 65,000,000 birds, or more than double the 1935 population

SIXTY-FIVE MILLION ducks can't be wrong! Yes, there are on the North American Continent in this year of 1940 about 65,000,000 wild ducks and geese that will have provided sport for 1,000,000 to 1,500,000 waterfowl hunters and pleasure for an even greater number of nature lovers.

From 1900 to 1935 our wild duck population dropped from an estimated total of 140,000,000 birds to the alarmingly low figure of 27,000,000. The plight of this diminishing host of Americans was recognized as early as 1913, when the Migratory Bird Law was enacted. In 1918 the Migratory Bird Treaty Act between Great Britain and the United States was ratified, our first big attempt at wildlife conservation. Under this treaty, among other protective measures, the spring shooting of waterfowl was prohibited in Canada and the United States and the hunting season was definitely limited. The treaty, however, did not stop the downward plunge of the waterfowl population.

Since 1931 the Great Plains have witnessed the most terrible drought in history. In that region, our most productive duck territory, rainfall began decreasing and water levels were lowered before 1900. In the long dry period that followed, about 100,000,000 acres of waterfowl marshlands were drained. At the close of the duck season in 1933, many sportsmen were ready to write the obituary for waterfowl. If each of the million duck hunters had killed one and a half days' bag limit in 1935, our ducks would now be in the same category as the extinct passenger pigeon.

The cold facts of the great decline, however, spurred sportsmen, nature lovers, scientists, and conservationists to redouble their efforts to save this resource. The Migratory Bird Hunting Stamp Act was passed in 1934. This law requires all duck hunters over sixteen years of age to purchase at \$1 a migratory bird hunting stamp. The funds thus raised, amounting to about \$1,000,000 a year, are administered by the federal Fish and Wildlife

Service. The law specifically states that at least ninety per cent of the money derived from stamp sales shall be used for the acquisition, improvement, and restoration of waterfowl habitat. To date, 10,000,000 acres of marshlands have been purchased and improved for waterfowl from duck stamp money aided by emergency funds. Many states, too, have restored thousands of acres of breeding, resting, and refuge areas.

With Canada likewise doing its part toward improving water areas and protecting birds, the Migratory Bird Treaty Act was amended in 1936 to extend its provisions to Mexico, and a treaty between that country and the United States was ratified on March 15, 1937. As a result of this coordinated work, together with increased rainfall during the past five years, the duck and goose population has doubled. It has been authoritatively stated that if the present shooting regulations remain in effect and if another 4,000,000 acres of marshland is improved, the waterfowl population will be doubled again during the coming five years. When this is accomplished, most wildlife managers believe that we shall have perpetuated the threescore species of waterfowl and the great sport of duck and goose hunting.

The restoration program has been a sound business proposition. It has been estimated that about \$50,000,000 is expended yearly in duck-hunting equipment, hunting properties, guide service, transportation, and incidentals. Millions of valuable song birds, fur-bearing mammals, and upland game have been produced in these restored waterfowl areas. Agriculture has benefited by the restoration of water in many parts of the country. In years to

come, the waterfowl management program will be considered the greatest wildlife restoration program the world has ever witnessed.

The most sought-after big game animal in North America is the white-tailed deer, which, at the turn of the century, was almost extirpated over many of the wooded regions of the United States. Market hunters and destruction of forest areas had just about made the deer a curiosity in many states. With the increase in the number of people who hunted for sport and not for financial gain, however, proper laws were passed and restoration practices were undertaken. It was estimated that in 1937 there were 3,000,000 white-tailed deer in the United States; in 1938 there were about 3,500,000. These fine animals are found in forty-three of the forty-eight states. With the restoration of forest lands throughout the eastern half of the United States, the day is not far off when there will be 10,000,000 white-tailed deer roaming over our hills and vales. In fact, in many areas there are more deer today than were present when Columbus discovered America. Hunters in Pennsylvania during the fall of 1938 harvested 170,000 surplus deer.

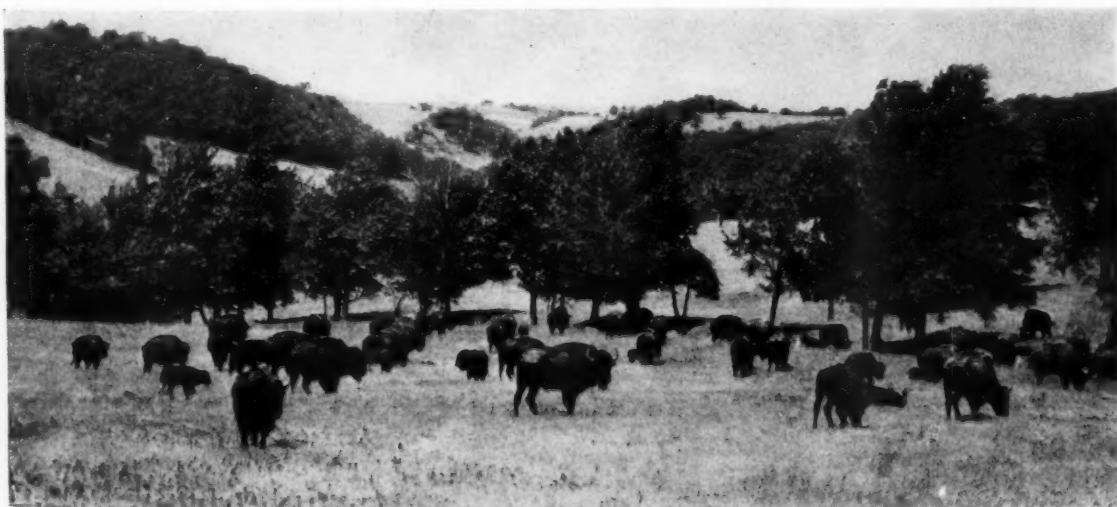
In the West, the mule deer and the black-tailed deer are also increasing, due chiefly to better game laws and the restoration and management of forests. California alone has about 500,000 of these large deer. Mule deer are found in fifteen states, and the black-tailed deer in California, Oregon, and Washington. Wise management of these great animals includes the removal of the yearly surplus by sport hunting.

Twenty-four years ago E. W. Nelson estimated that there were



Randal McCarr

Fawn of the White-tail Deer—Most sought-after big game animal in North America



The Buffalo of the plains—a present day herd. His recuperation achieved, there is now no danger that this historic animal will become extinct

P. E. Randall

more than 40,000 elk, or wapiti, in this country. Since 1930 they have become so abundant under protection that in some overpopulated areas many died of starvation. Today there are about 228,000 elk in twenty-four states.

As recently as 1922, only about 27,000 prong-horned antelopes were found on the western plains. Years of range misuse and inadequate protection had reduced their number drastically. The innate curiosity of this fleet animal was partly responsible for its flirtation with the Happy Hunting Grounds. Indians used this weakness to their advantage when hunting. It was common practice for hunters to sneak within several hundred yards of a band and then lie on their backs and kick their feet in the air. These strange movements were too much for the antelopes; they had to investigate and, in so doing, came within shooting range.

During the past fifteen years better cattle and sheep range practices have been initiated over parts of the antelope range. The number of refuges on which antelopes are protected has increased, and game-law enforcement has been better organized. As our western cattle country regains its grassland, the antelope will also return in numbers suitable for better sport hunting. Wyoming and Oregon have more of these agile, white-rumped animals than any other state.

The moose, the bugler of the North Country, apparently is being perpetuated in some of our northern forests. No accurate figures are available on the lowest point of its existence, but it is known that moose were nearly extinct over most of the United States in 1900. In 1937 there were about 13,000 of these animals, and by 1938 the number had increased to 16,000. According to old records, moose were formerly found in fourteen states. Today they occur in Wyoming, Minnesota, Montana, Maine, Michigan, Idaho, and New Hampshire.

It has been estimated that prior to settlement of the white man in this country there were at least 75,000,000 American bison, or buffaloes, roaming in great herds over the continent. In haste to exploit the western plains, hide hunters of the past century almost exterminated these large brown grazers. Strange as it may seem, this near-extirpation was aided by our government, which is now one of the world's greatest protectors of wildlife. This sanction of killing was brought about by the need and desire to suppress the Plains Indians. The redmen of the prairies derived practically all their wants from the buffalo, and by eliminating this staple, the Indians could easily be subdued. Thus the federal government encouraged the almost total harvest of buffaloes and in many cases went so far as to furnish ammunition to the hunters. The few buffaloes that survived were relegated to zoos, refuges, and private lands.

For many years most people thought it was only a matter of time until the buffalo would be listed among those missing. Through the work of private, state, and federal agencies, however, there are today about as many buffaloes as can adequately be managed. No longer is there danger that this historic animal will become extinct. Most areas suitable and available for buffaloes are fully stocked, and some difficulty arises each year in finding outlets for surplus animals. There are now about 5,200 buffaloes in the United States.

The bighorn sheep of the Rocky Mountains and the deserts have reached a very low point. Many people believe that they may become extinct. There are at present about 11,000 of these animals in the United States. For the past two years they have just about held their own. A number of theories have been advanced as to why these illustrious animals are not increasing. Some

people think that domestic sheep have carried parasites and diseases into the bighorn herds. Others believe that the total population is so low that sex ratios are out of balance and normal breeding cannot take place. Diligent efforts are being expended on research, restoration, and protective measures by state and federal groups. It is hoped that in the near future it can be reported with pride that these natives of the mountains and sagebrush have been perpetuated.

In 1937 there were about 13,000 mountain goats in this country, and in 1938 the estimate exceeded 14,000. These dare-devils of the high places are found only in Idaho, Montana, Washington, and South Dakota. Agencies managing the western mountain lands are taking into consideration these spectacular dwellers of the cliffs, and there is no reason to believe that they will decrease.

Not so many years ago the black bear was looked upon as vermin. They were shot, trapped, tracked, poisoned, and hounded during all seasons of the year. A gradual change in the status of this shy quadruped became noticeable. Sportsmen began to realize its value as a game animal. Today in several of the eastern states it is almost as popular as the white-tailed deer as sporting game. As a result, protective laws have been enacted in some states and only a limited hunting season is allowed. In those states that have recognized bruin as a game animal and have encouraged its increase by protective measures, it is holding its own or even increasing. In 1937 there were about 81,000 black bears; in 1938 this number had increased to 94,000. These sages of the forest are found in thirty-six of the forty-eight states. Believe it or not, there is good black bear hunting within 175 miles of Philadelphia.

The grizzly bear, the most feared of the native mammals within the boundaries of this country, has been extirpated over much of its former range, but there are still about 1,100 individuals of this species. Montana and Wyoming have most of these, but a few occur in Arizona, Colorado, Idaho, New Mexico, Utah, and Washington. The species should be perpetuated, but these animals are not needed in the tens of thousands.

The woodland caribou is a very close relative of the Old World reindeer, the animal that has become so closely associated with Christmas. It is of interest to note that both sexes of this deer carry antlers, whereas antlers are found only on males of the other deer. There are not many parts of this country in which the caribou thrived at any time. They were found in suitable environment in several of the northern states before 1880. In New England, with the exception of Maine, they were perhaps never more than rare stragglers. The caribou, however, is one of our native big game animals, and its extinction should be prevented. Sixteen animals are reported in Minnesota and Washington. Fourteen are making a last stand in Minnesota, and determined efforts are being made to rehabilitate part of the former caribou range in that state.

The native pig, or peccary, is found in Texas, Arizona, and New Mexico. These little big game animals of caves and brushland were practically extinct less than twenty years ago. Through their tenacity of life, however, and their rugged make-up, along with better protection, they have managed to survive and to start on the comeback trail. Whether found on federal forests, state lands, or on private ranges, these animals are being given more consideration in the wildlife program. At present there are about 40,000 of these native citizens, and their increase should be encouraged.

State game organizations (*Continuing on page 48*)

AN ANCIENT FOREST OF THE PACIFIC NORTHWEST

As Revealed by Recent Studies of Remains Petrified
In Lava That Flowed Ten Million Years Ago

By CAMPBELL DAVIS

THE LAVA-PRESERVED forests of Washington are by far the most outstanding petrified forests known to the world. In the amazing 7,000-acre Ginkgo forest of the central state, there are thousands of fossilized logs representing more than seventy-five tree genera, ranging from swamp cypress to alpine hemlock. Subtropical, Asiatic, European, and eastern American types are represented. All of these—in a paradoxical setting of arid, timberless sagebrush land.

This stone forest is the recent discovery of George F. Beck, associate professor of geology at the Central Washington College of Education in Ellensburg, Washington. It was given the name Ginkgo because of the presence of a dozen logs of the sacred Ginkgo or "temple" tree of China and Japan. This is the first authentic finding of the preserved wood of this most famous tree.

Ferretting out the hidden logs and leaf beds over a vast area without resorting to large-scale excavations,

was a major detective job in geology. Except for a few isolated trees exposed along the east bank of the Columbia river in this district and the scattered fragments of opalized wood, there was no hint that jackrabbits scampered over one of the rarest and most remarkable geological features of the world. Beck spent two years in tireless prospecting, accompanied at times by fellow geologists or enthusiastic geology students from the Ellensburg college. Petrified wood was collected, analyzed, studied. Bit by bit the veil was lifted from the hidden past as evidence of a great prehistoric forest was revealed.

The Washington geologist is now at the University of California, where he is studying selected specimens of fossil leaves and log sections in preparation of a doctorate thesis. Conclusions reached in his observations to date have convinced him that tree species to be found in the Ginkgo forest may number between five and six

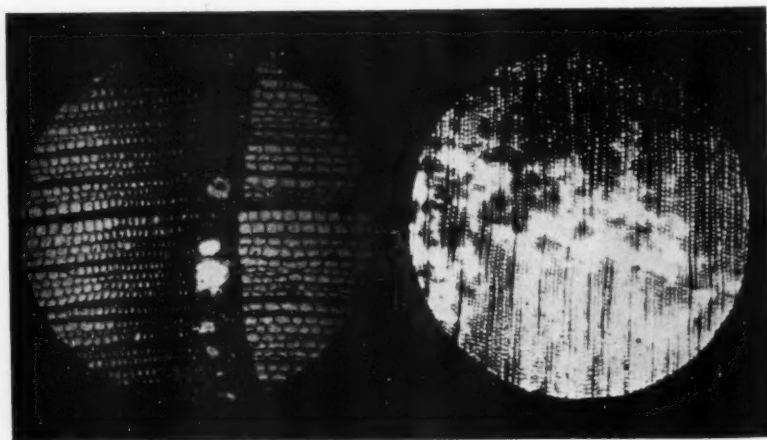


Strange and mysterious is the country of the Grand Coulee, where a cross-section of more than ten million years' time exposes layer upon layer of lava flow and integrated forests, bared by the eroding waters of the Ice Age. Here on the shores of Blue Lake may be seen lava molds of long extinct animals, trees and petrified logs



A visitor to the Ginkgo forest inspects a well-preserved log of opalized spruce. Such exposures are almost continuous within a wide area of the justly famed forest. Above—This is the lava mold of a giant Sequoia, extending far back into the cliff. The lower portion has been partially filled with sediment. This is clearly the "pillow" type of basaltic formation, commonly found where flowing lava has been chilled in water, thus preserving the trees immersed beneath the surface. Air-cooled lava usually takes columnar basaltic form

Right—Vitaly interesting photo micrographs by Bvor Grondahl, professor of wood technology at the University of Washington,—for they are conclusive proof of the almost inconceivable forests existing during the Miocene period. The first is a cross-section of Cedar of Lebanon. No record exists of the petrification of this rare tree elsewhere in the United States. The cellular structure is clearly shown here in the well-preserved rows of ducts. The next cross-section is of Yew—a generalized conifer without resin ducts or cells to modify the cell rows



hundred. In the famous Cerro Cuadrado petrified forest of Argentina, on the other hand, only five tree genera have been found; seven have been identified in the Amethyst Mountain forest of Yellowstone National Park, and twelve in California's petrified forests.

Looking backward through the mists of time, here is how Beck envisions Washington's prehistoric forest of ten million years: in the upper regions of the state, and extending beyond the international boundary into British Columbia, there existed noble forests of fir, pine, hemlock, beech, birch, hickory, hard maple and chestnut. In the lower altitudes were great forests of red gum, walnut, elm, spruce, merging in the deep-cut valleys with groves of maple, oak, spruce, tamarack and sycamore.

And among all these sturdy types there grew certain of the tree aristocracy; impoverished descendants of proud, ancient lines, that were slowly being crowded out. Some of these—such as the odorous Cedrella, the cigar-box-wood tree—traced their haughty lineage back to subtropical times. Others, like the sacred Ginkgo, whose relatives still grow naturally in Asia, represented an ancestry dating to the dawn of tree history. There was an abundance of the sturdy, time-defying Sequoia, now flinging its might to the skies only in the fastnesses of California.

There were no men in these great, mysterious forests to challenge the world of darkness and light that existed beneath the spreading crowns of those magnificent trees. Instead there were strange and grotesque animals,

such as the giant clawed horse, *Moropus*, there were little three-toed horses, and the long-necked camel, *Alticamelus*. Most of the herbivores fed largely upon shoots and leaves of the forest. Some of them and of the birds and rodents existed essentially as they do today. And always, there was a terrible and unceasing struggle for existence. The land was over-run, as it has never been before or since, by overwhelming numbers of blood-thirsty doglike and eatlike animals.

Upon this scene there came a rank outsider—the small four-tusked mastodon, who had just wandered into North America from Africa across the Alaska land bridge. Puzzled, hostile eyes, watched—and generally left unchallenged—the stranger who was to advance the proud line of imperial elephants as we know them today.

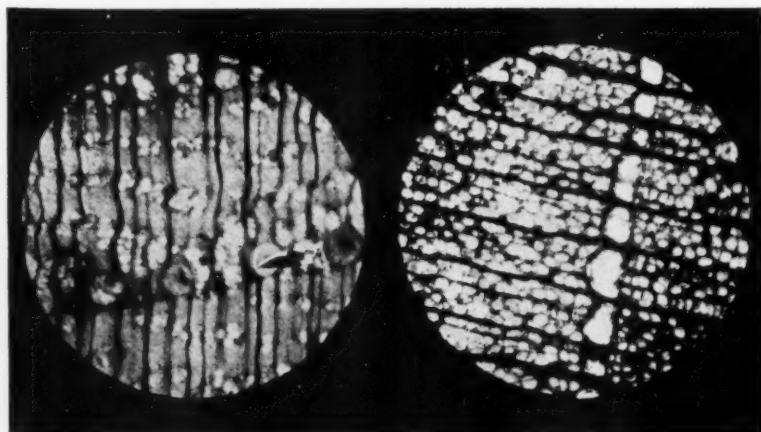
Hornless deer scampered about the forests. Countless herds of assorted pigs grunted and coughed at their rooting in the earthy mold. The forest was alive with the singing of the birds, the calls and cries of animals, the buzzing of insects. Flowers grew in profusion.

Then as now nature had her moods. A great storm with cyclonic winds swept over the forest, tearing giant trees from the ground and hurling them upon each other in a tangled mass. A few years later, there came a winter of tremendous snowfall, followed by a spring of high floods, which carried the fallen trees from the hill country, through wide valleys, to the low country that lay southward.

(Continuing on page 44)



J. C. McCann of Coulee City, is sitting in the root of a giant Sequoia which grew in a Washington forest of the Miocene period. Softer than the surrounding basalt, the fossilized wood eroded away, leaving only the lava mold. Above—Within a cavity in the basaltic cliff was found the body mold and bones of an extinct type of water-loving rhinoceros—discovered lying on his side, legs stuck out stiffly—just as he probably lay when overwhelmed by hot lava in the waters of an ancient lake ten million years ago



Trees unknown to the region today were found in the great prehistoric forests of the lower altitudes, ten million years ago

To the left—Elm: note the "wavy" pattern of vessels and single row of large initial pores

Right, Red Gum (liquidambar) with traumatic duct rows

THE CEDARS OF LEBANON --

THEN AND NOW

But Four Small Groves Remain of the Famous Forest of Lebanon Which Gave Its Fragrant Wood to Temples and Palaces, and Around Which the Ancient Phoenicians First Battled the Menace of Soil Erosion

By W. C. LOWDERMILK

Photographs by the Author

NO FORESTS or trees in human history have been so bound up with the development of ancient civilizations as have the cedars of Lebanon, and no other trees were so frequently mentioned in ancient literature. The Phoenicians brought fame to these great trees, and in turn, the cedars brought profit and renown to Phoenicia.

The fate of this famous forest is bound up with the rise of the Phoenicians. Archaeological evidence reveals that more than 5,000 years ago, this Semitic tribe came out of the desert and founded a series of harbor towns along the eastern shore of the Mediterranean Sea. Of these, the most commonly known were Tyre and Sidon. The limited flatlands of the mountainous country soon proved insufficient to supply food for this growing people. They were faced with alternatives, such as migration and colonization, industry and commerce, and the cultivation of sloping lands as rapidly as forests were cleared. Evidences of the first two are in historic records but evidence of the third is found in the land, which I studied in field trips and in two airplane flights in 1939.

History opens with the Phoenicians as the earliest traders on the seas — and the cedars contributed to their commerce. Their lands were bounded by the sea on the west, and by steep slopes of the high Lebanon Mountains, covered with dense forests of cedars and firs, on the east. Enemies beset them on the north and on the south. Limited resources forced them into exchanges of cedar timber for food supplies and other necessities.

Long before 3000 B.C., the Phoenicians are known to have exchanged cargoes of cedar wood for the flint and bronze articles produced by the Egyptians. The arrival of forty shiploads of this wood in the Third Dynasty before 2900 B.C. is noted in the ancient records at Karnak, Egypt. From the timber of these forests of Lebanon, the early Egyptians made their large boats, also pillars and doors for their temples. Because of this coveted timber, Byblos, on the coast of Phoenicia, became the port of shipment and was subject to the Pharaohs of Egypt. During the period of the expansion of the Egyptian Empire, the cedars of Lebanon furnished part of the

The entire Tripoli Grove of Cedars, showing its beautiful setting, the characteristic horizontal branching, the stone wall which keeps out goats, and the young growth resulting from this protection



impetus for the Egyptian conquest of the eastern Mediterranean.

By a curious fact of geography, the Lebanon and Anti-Lebanon Mountains, paralleling the eastern shore of the Mediterranean, lay almost midway between the great alluvial plains of the Tigris-Euphrates and Nile rivers. In these fertile but arid and treeless plains, early settlements developed into populous empires on irrigated agriculture. These empires were largely dependent upon the forests of cedar, fir and pine on the lofty Lebanon Mountains for their timber supply. The fragrant wood of the cedars was most sought after.

Palaces and temples of the ancient world, extending from the Nile to the Tigris-Euphrates rivers, were adorned by wood of cedars of Lebanon. Recently discovered correspondence of King Zimrilim of Mari on the Euphrates, dating from about 2000 B.C., tells of his sending boats to Carchemesh, northeast of the Lebanons, to be loaded with cedar and other timber. In the great cylinder inscriptions dug up at Tello, the site of ancient Lagash in Babylonia, its ruler Gudea tells how he built a road in the Lebanon Mountains, cut great trunks of cedar trees, and floated them down in rafts for beams, stair-rails and doors of the great temple he built.

A bas-relief of the Louvre coming from the palace of Khorsabad represents a flotilla of boats loaded with beams. Two fortresses in the background, one on an islet, identify the locality as Sidon, in front of the Lebanons, whence timber was shipped to a point farther north by sea, and then taken over mountain passes and on to Assyria. Fragments of clay tablets found in ancient Assyria preserve the record from Tiglathpileser I, of about 1100 B.C.: "To Mount Lebanon I went. Logs of cedar for the temple of Anu and Adad, the great gods, my lords, I cut and brought away."

An inscription of Assur-nasir-pal, who reigned from 883 to 859 B.C., found at Tell Balawat—the ancient Imgur-Bel — records: "I marched into Mount Lebanon and cut down beams of cedar, cypress, and juniper, with the beams of cedar I roofed this temple, door-leaves of cedar I fashioned, and with a sheathing (bands) of copper I bound them, and I hung them in its gates."



This is one of the cornerstones, or boundary markers, of an ancient Cedar of Lebanon forest under the protection of the Emperor Hadrian. It is now in the Museum of the American University of Beirut, in Syria. The detailed interpretation of the characters of the inscription on the stone is found on page 19

Isaiah indicates that both Sennacherib of Assyria and Nebuchadnezzar II of Babylon had the cedars of Lebanon felled. An inscription of the latter has been found in a valley on the northeast side of the Lebanon in which the king describes how he split the mountain and broke the rocks to make a way for sliding out the long tree trunks.

The Bible contains numerous other references to the cedars of Lebanon and gives a vivid picture of the extent of the cutting of timber for ancient works of construction. King David first imported the cedars for his palace and later:

"Solomon sent to Hiram, king of Tyre, saying, now therefore command thou that they hew me cedar trees out of Lebanon . . ." and Hiram replied: "I have considered the things which thou sendest to me for; and I will do all thy desire concerning timber of cedar and concerning timber of fir. My servants shall bring them down





In some parts of the Lebanon Mountains, especially where religious sects sought refuge from persecution, one finds most amazing works of terracing, laboriously constructed for cultivation, which, at modern costs, would run from two to four thousand dollars an acre just to build the stone walls on such precipitous 50 to 75 per cent slopes



The largest Cedar remaining standing today is forty feet in circumference at breast height and over 1,500 years old, but no ring counts can be made, of course. These veteran trees stand on two knolls, five on one and seven on the other,—and the Maronites hold a religious festival here every year on the feast of the Transfiguration, in a little chapel among the Cedars

from Lebanon unto the sea, and I will convey them by sea in floats unto the place thou shalt appoint me, and will cause them to be discharged there, and thou shalt receive them and thou shalt accomplish my desire in giving food for my household. And Solomon gave Hiram twenty thousand measures of wheat for food to his household and twenty measures of pure oil, thus gave Solomon to Hiram year by year. And there was peace between Hiram and Solomon; and they made a league together . . . and King Solomon raised a levy out of all Israel . . . and Solomon had three-score and ten thousand that bear burdens and four-score thousand hewers in the mountains beside the chief of Solomon's officers which were over the work; three thousand and three hundred, which ruled over the people that wrought in the work . . . so they prepared timber and stone to build the House.

"And Solomon built the walls of the Temple with boards of cedar, both the floor and the walls and the ceiling . . . and the cedar of the house within was carved with gourds and open flowers; there was no stone seen, and . . . he overlaid it with pure gold, and so covered the altar which was of cedar."

We visited Tartije, a small mountain village, where doubtless some of Solomon's lumberjacks had lived. The village is surrounded by terraces, most of which are broken down, and by treeless barren slopes. Far up on the whitish limestone slopes were scattered individual cedars, dark green against glaring rock. Solomon's force alone of 80,000 "hewers of wood," and 70,000 "bearers of burdens," working in relays, year after year, suggests extensive and heavy stands of these ancient forests. Moreover, other kings of ancient peoples

made treaties with the kings of Tyre and Sidon to obtain the famous cedar timber of old Phoenicia.

Although the cedar forests of Lebanon had been cut since the dawn of history, a considerable area remained and was protected during the Roman period. This is indicated by boundary stones standing now in barren mountains. The meaning of the letters DFS often found inscribed on these stones, along with the abbreviated name of the Emperor Hadrian, was for years a mystery. Several were removed to museums. The mystery was solved on the discovery of a large corner stone on which DFS was written out in full, reading as follows:

IMP-HAD, AU the abbreviation for IMPERATOR HADRIAN, or Emperor Hadrian, and AU is combined in a single character.

G-DEFINITIO. The AU of Augustus is on the first line. DEFINITIO means limits, or boundary.

SILVARUM, means "of forests."

The accepted translation of the stone is:

EMPEROR HADRIAN AUGUSTUS
FOREST BOUNDARY

These numerous and widely distributed inscriptions were obviously boundary markers of a forest area protected by imperial edict.

It is not known whether forest management was practiced by the ancients to assure a sustained yield of timber. But these boundary markers in Roman times indicate that the forests were protected from indiscriminate cuttings and possibly from fire as well. Extensive works of water and soil conservation practiced under Roman rule lead us to believe that the Romans fostered sound ideas on conservation, and they doubtless cut with some idea of maintaining the forest stand.

During the Roman and Byzantine domination, up to the Arab invasion in 630 A.D., the forests



This is the little Marionite Church which has made the grove of the Cedars of Lebanon a sacred place, similar to the temple forests of China. And it serves to dispute the assumption that the disappearance of this famous forest was due to adverse climatic change

The storms and winds of centuries have beat upon these mighty Cedars of Lebanon. Human hands have destroyed their companions, and the heavy snow hides the ugly slopes where many others once stood. The mountain heights sleep now in silence, buried deep in a mantle of snow

were used throughout the Roman world in great temples, works of construction, and for Roman ships that plied the Mediterranean. The nomad Arab invasion, however, destroyed conservation works of all kinds, or allowed them to fall into disrepair from neglect. Little or no effort was made to preserve forest growth, and the forests of cedar dwindled. It is a custom of long standing to permit common grazing of all fields after the harvest until the next plowing in spring. The ubiquitous goats grazed back seedlings, preventing reproduction. The soil was denuded of vegetation, exposing it to heavy erosion with the winter rains after the long, dry summers. Furthermore, sharp hoofs of sheep and goats clambering up and down the rock-walled terraces dislodged the stones; the soil behind the terraces rapidly eroded away unless they were kept in repair.

The last slaughter of these remaining mighty trees of Lebanon took place during the Turkish domination from 1516 to 1918. A tax was imposed on every individually owned tree; thus a premium was set on annihilation of trees and forests. On national or common lands, trees were exploited to supply fuel for locomotives during the World War, when Turkey was cut off from supplies of coal by the blockade.

Since the Arab invasion, thirteen centuries ago, the forests of Lebanon have been exploited and neglected, until the slopes have been rendered barren, gray, and rocky, making impossible the restoration of forests equal to the original stands. Some possibilities for reforestation still exist, however. Solution crevices and solution pockets in the limestone are filled with soil. When trees are planted their roots search out these crevices and do surprisingly well, showing that misuse of the land rather than climatic change has rendered this vast historic area barren and desolate.

Today, but four groves remain of the ancient and famous forests of cedars which once extended over an estimated area of 2,000 square miles. Of the three groves which I visited, the Barouk and Massa groves are less accessible and consist of isolated patches of trees on steep rocky slopes. The most important is the Tripoli grove, located on two small knolls at an altitude of 6,000 feet in the cup of the valley at the head of the deep gorge of the River Kadicha. On the basis of certain findings, the recent history of this historic grove is reconstructed as follows:

Until about 300 years ago, the trees were unprotected and had been reduced to forty-four "wolf trees" among the rocky barrens still marked off by Hadrian's boundary stones. A Maronite Chapel was built about this time for the shepherds who ran their flocks over the upper slopes of the mountains, and the Tripoli grove became sacred. The trees were then protected from vandalism and a wall built about the grove kept out goats. During these intervening years, the forty-four "wolf trees" have grown to a stand of about 400 straight stemmed cedars. Some of the veterans are estimated to be more than 1,000 years old, with the younger age class between 200 and 300 years. All cutting is prohibited, but a windthrown tree gave me an opportunity to make a ring count on its stump. The tree itself had been logged and sent to the

World's Fair at New York for an exhibit of the Republic of Lebanon. The stump was forty and a half inches in diameter, and showed 272 annual rings — the tree belonging to the younger age class. Now seedlings are growing up around the margins of the grove in the protection of the stone wall.

The largest veteran cedar measures forty feet in circumference at its base. These picturesque old giants are held in great veneration by the natives of today, who regard it a sin to cut any wood from them. Religious awe rather than foresight in conservation protects this remnant. However, no protection is given the surface roots from trampling by pilgrims and tourists, who come to the Maronite Chapel to celebrate a yearly festival in August.

This sacred grove of cedars yields valuable information in reading the story of land use as it is written indelibly in the land. For example, the restocking of the grove under protection since the construction of the little church refutes arguments that this forest disappeared because of an adverse change of climate. On the contrary, the evidence is that its disappearance is due to clear cutting followed by cultivation and grazing.

The cedar of Lebanon is a conifer, *Cedrus libani* (Loudon), and one of three species of the genus *Cedrus*; the other two being *Cedrus atlantica* (Manetti), of the Atlas Mountains of North Africa, and *Cedrus deodara* (Roxburghi), of the Himalaya Mountains of India. The form of the tree is distinctive; branches extend out horizontally from the tree stem and form level platforms which are distinguishable at great distances. The cones grow upright and the scales fall apart on ripening. The wood has a fairly fine grain, depending on the age of growth; it is hard and resistant to decay and insect attack. The sapwood is white and the heartwood reddish brown, making an excellent timber for construction. The fragrance of

the wood made it sought after for palaces throughout the royal courts of the Old World.

"By their fruits ye shall know them." With equal truth we may say that "By their lands ye shall know a people." An aerial survey up and down the coast of old Phoenicia revealed to me the most astounding spectacle of Herculean efforts, through the centuries of tillers of the soil, to protect sloping lands from soil erosion in order to provide a food supply. The tragedy of land misuse and wasteful neglect is written far and wide. Only here and there have continuous efforts at soil conservation achieved success.

The first chapter in this story of land use in ancient Phoenicia begins with the steep mountains covered with dense forests. As these cedars of Lebanon retreated before the ax, largely for commerce with Egypt and Mesopotamia, the land was cleared and cultivated to provide food for a growing population.

Since sloping fields eroded under the heavy winter rains then, even as they would now, we suspect that tillers of the soil of this early period first encountered problems of slope cultivation and of soil erosion on these slopes of the Lebanon Mountains. Breasted, Cherry and others believe that irrigated (Continuing on page 34)

TO A CHRISTMAS TREE

BY ANNE CAMPBELL

I saw your brother in a wood
Last summer where the northern sky
Comforted his green solitude . . .
I saw him lift his young head high,
And in the breezes, heard him sigh.

Perhaps he guessed it would be you
Chosen to leave his native place
To make a cherished dream come true,
And for a long day touch with grace
A city orphan's lonely face.

I saw your brother in a wood
In summer when the day was mild
Like you, he must believe it good
To bear the ax, to leave the wild,
To die, if need be, for a child!

(Copyright, 1938)—Detroit News.

THE FOREST and MEN'S SOULS

By FLOYD W. SCHMOE



¶ Some time ago a company of Ishmaelites, engaged in inter-state commerce, became involved in the first notorious kidnapping case. They took the boy Joseph from his racketeering brothers and sold him at a good profit down in Egypt. Their real business, however, was entirely legitimate. Their camels bore spicery and balm and myrrh from the forests of Gilead to the dusty markets along the Nile.

¶ The Egyptians were civilized; they had shoes and chariots and flesh-pots and slaves; but they needed the balm of Gilead.

¶ Like the Egyptians of Joseph's time, we are far too inclined to weigh values in terms of material things. What we have makes the man, not what we are. And too often we discover that after we have accumulated a great deal, we have very little left. The fabric of our civilization is too heavily woven with the stuff of things. There has been too slight an increase in the moral strength of the warp. It becomes a blatant, gaudy, shoddy piece, inclined to fall apart from its own leaded weight.

¶ For a hundred thousand years man lived in the wilderness, brother to the beast. He was part of the forest community. He had no ax, no gun, no plow, no barbed wire. He was to a degree predatory, but he was not exotic; he was endemic; he belonged. And in common with the beast he enjoyed his full measure of peace — he knew contentment.

¶ Now man has become civilized. He eats civilization's foods, he wears civilization's clothes, he listens to civilization's noises. His house is air conditioned; even the modern chariot in which he dashes frantically about over the face of the earth is hermetically sealed; the air he breathes is civilization's air. He moves too fast and he has allowed himself to become over-crowded.

¶ But man does not thrive. The human animal degenerates mentally, morally, and physically under such conditions. The pace is too rapid, the strain too great. Of the two million hospital cases in America today more than half are mental cases, and many of the others had their origin in mental disorder. He develops new diseases faster than his medicine can find cures for his old ones. Crime and war and immorality all increase in direct ratio to excessive crowding and high-pressure living.

¶ So it is apparent that man has lost something. Perhaps he has lost several things. One, most certainly, is this peace of mind, this contentment, which the lower animals still have — and which man so sorely needs. Our whole civilization cries out for this balm from the fir trees of Gilead.

¶ Man, if he is to survive, must recapture a measure of the mental stability of the animal. To do so he must return more often to the primitive, answer more often the call from his far distant past. He must seek solitude, he must find peace and quiet, he must attain contentment.

¶ But where can he find peace, when he cannot find quiet? How can he find contentment, when he cannot find solitude? Art, music, literature, a garden — a garden of his own, a garden with growing things — they all help. But even a man's garden is in a sense an artificial thing, a managed substitute for nature.

¶ So he must look still farther. Wise men have pointed the way: Christ went into the wilderness to meditate and pray; David sang his psalms while tending his flocks in the open fields; Francis of Assisi wandered the paths and byways of the woods and preached to the birds and the trees; Beethoven composed his sonatas while seated on a log in the forest; and Audubon, Thoreau, and Burroughs recreated by their own respective Waldens. In the wilderness there is a quiet solitude.

¶ The forest itself typifies the wild, the primitive. True, there are other wildernesses in nature — the sea, the desert, the great plain, even the vast sky above. They are all good for they are all natural. They have quiet, they have beauty, they inspire. But they are all to a degree inanimate. The forest is alive. It is a community of growing things.

¶ Man too is alive, he is related to the forest dwellers. With the tree and the vine he has much in common; to the bird and the animal he is own brother. Man must recognize this kinship with nature. He must put himself again in tune with the wild.

¶ There have been times when man was dependent upon the forest for his very life. He still enjoys the physical products of the forest, but the time has come when he must learn that, from the standpoint of his own basic needs, recreation is the forest's highest use. Recreation is physical, yet it is also mental and spiritual. And mental and spiritual values must be given first place, for without mental balance and spiritual peace, physical health is impossible, and physical joy unknown.

¶ Enjoy the esthetic, the inspirational values of the forest wilderness and physical recreation will not lag far behind. In choosing the one we do not lose the other; rather do we gain both. And, also, since nature is generous with food for man's body as well as for his soul, the material "by-products" of the forest need not be neglected; the wood for the builder, the pulp for the press, the basic chemicals will still be available to man. But he must care for what he has, — give nature a fair chance, — place first things first. And then all these things shall be added unto him.

THE FIGHT FOR THE ELMS

Review of Progress Made in the Campaign Against the Dutch Elm Disease

By E. G. BREWER

THE Dutch elm disease has been known in the United States for eleven years and during this period 60,975 trees infected by the fungus organism causing the trouble have been located. The infection is found in a major region comprising parts of Connecticut, New York, New Jersey, and Pennsylvania lying roughly within an eighty-mile radius of Lower Manhattan. In addition a few infected trees have been found at Old Lyme and Preston, Connecticut; Indianapolis, Indiana; Baltimore, Brunswick, and Cumberland, Maryland; Binghamton and Hancock, New York; Athens, Cincinnati, Cleveland, and Hockingport, Ohio; Buckingham, Susquehanna, and Wilkes-Barre, Pennsylvania; Norfolk and Portsmouth, Virginia; and Wiley Ford, West Virginia. The accompanying map shows the localities where the infection is known to occur in the United States, including both the major region and the active and inactive outlying points. The disease in this country has been traced to the importation of diseased elm logs from Europe for the purpose of making veneer and their transportation from ports of entry to veneer-making establishments.

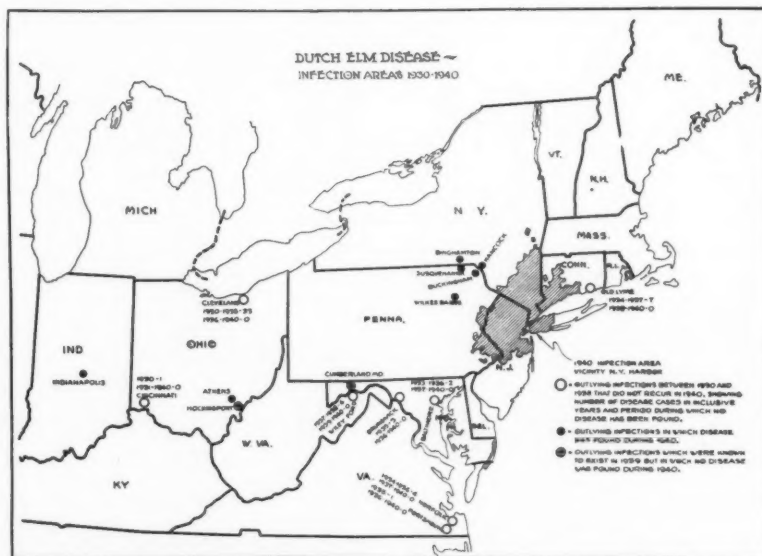
Scouting to locate infected trees has each year added to the area known to contain infection. The number of diseased trees found each year has varied since 1933. The greatest number, 18,152, was located in 1938, followed by 10,786 in 1939, and 3,931 through September 30 in 1940. The number of diseased trees found by location and year since 1930 is shown in the table on page 24. The picture it presents, in the reductions of diseased trees in 1939 under 1938 and in 1940

under 1939, gives promise that the methods being employed are reducing the amount of the disease and can in time limit its occurrence and spread if not completely eradicate it. Indeed the latter objective still seems a tenable one in view of the reduction in the number of diseased trees found during the last two years.

There is one isolated point of infection, Cincinnati, Ohio, at which no diseased trees have been located for 10 years. There are three isolated points of infection, Brunswick, Maryland; Cleveland, Ohio, and Portsmouth, Virginia, where no diseased trees have been found for five years. At two isolated points, Baltimore, Maryland, and Norfolk, Virginia, there has been no recurrence of the disease for four years, and there are other points where no diseased trees have been found for one, two or three years. These failures to locate diseased trees in places where infection has been known to occur following scouting and eradication work by the Department further support the assumption that the methods being used are yielding the desired results.

While the major region of infection has increased from 2,464 square miles in 1934 to 10,900 square miles in 1940 and an additional number of isolated points of infection have been found, these increases, though unfavorable

factors, are not considered handicaps too great to be overcome. Neither the extension of area in the major region of infection nor the new isolated points of infection found are definite evidence of recent and rapid spread of the disease. This is supported by studies of the diseased trees in certain extensions of territory. However, not as much information is



Shaded area above shows the main region of Dutch elm disease infection. At a number of outlying points a few infected elms have been found. These points are shown by circles, indicating present status of these infections as explained in map legend

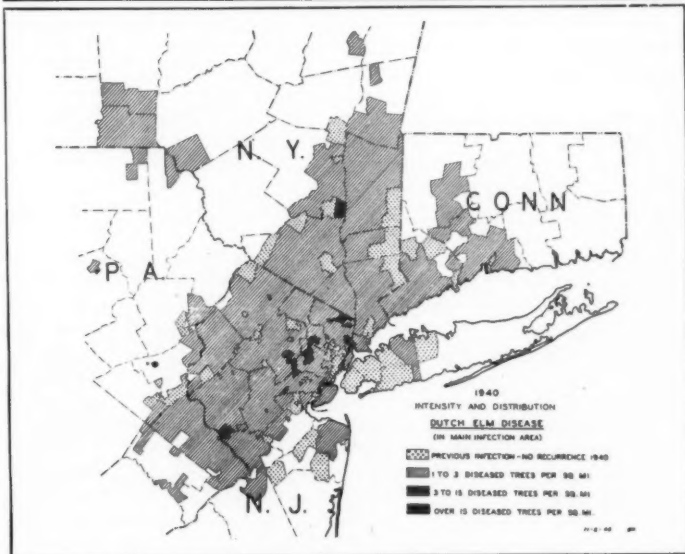
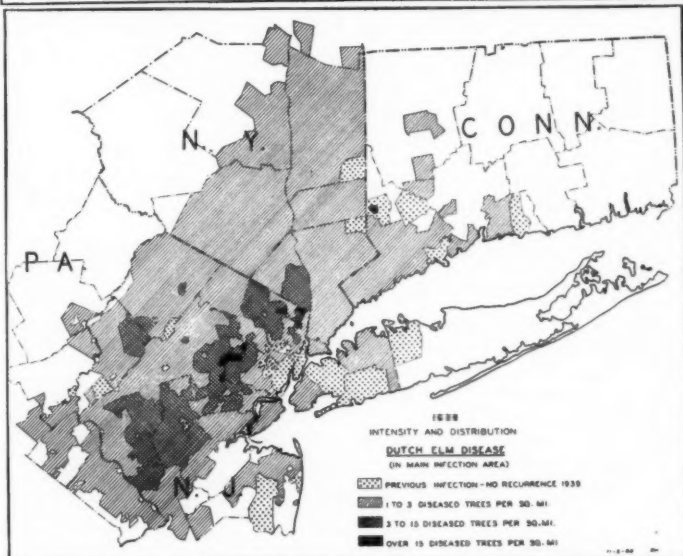
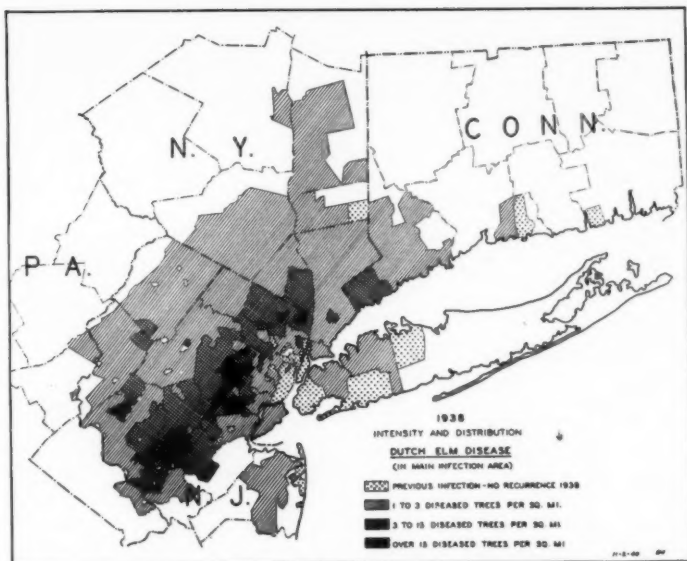
available about the period of time the disease organism has been present in various localities as is desirable.

The amount of money and number of men available for scouting has had a definite and important influence on the method and thoroughness of the scouting, the extent of the area scouted, and the results obtained. Until 1939 plans for scouting the major work region consisted of surveying the territory known to contain diseased trees and a so-called "protective zone" approximately ten miles deep just beyond it, as thoroughly as possible at least twice annually. Each year diseased trees were located in the "protective zone," increasing the territory known to contain infected trees.

In 1939, an increase in Departmental funds appropriated for the work, made it possible to scout rather intensively a border zone about fifteen miles deep; to scout less intensively an advance zone between the outer limits of the border zone and a circumferential line 100 miles from Lower Manhattan, by following highways, streams and railroad lines, observing a large proportion of the elms; and finally to scout very lightly and rapidly many highways, streams and railroads in the vast expanse of territory between the 100-mile and 150-mile circumferential lines. The addition of over 2,300 square miles to the major region of known infection and the finding of diseased trees near Binghanton, New York, and Hoekingport, Ohio, increased the work area and problem considerably but demonstrated the value of the extended scouting.

In the spring of 1940 work plans were again developed to scout a vast territory. Unfortunately the amount of money appropriated for the fiscal year beginning July 1, 1940, was reduced and the funds did not become available soon enough for their most effective use. It therefore became necessary to readjust plans to the reduced allotments and to the delay in their availability. Some reduction had to be made in the area to be intensively scouted. Most of the regular funds were allocated to scouting beyond the major region of infection and in the isolated points of infection. The main sector of work consisted of a border zone roughly fifteen miles deep surrounding the main region of infection and containing 5,500 square miles, which was rather intensively scouted, and an

These three maps — each portraying the major region of Dutch elm disease infection in this country — give an encouraging picture of the progress being made to save the American elm, in their showing of the decreasing intensity of the infection during the last three years. Note that the areas of the heaviest or more intense infection in 1938 are absent or greatly limited in 1940



advance survey zone beyond this varying from fifty to 100 miles in depth, which was irregularly scouted. This scouting work yielded for the year one tree in the vicinity of Hancock, New York; one tree in the Buckingham, Pennsylvania, area; four in the Susquehanna, Pennsylvania, area; forty-one in the Wilkes-Barre, Pennsylvania, area, and an addition of 1,900 square miles of the border zone to the major region of infection.

The major region of infection (inside of the border zone mentioned above) was scouted almost entirely with emergency relief funds. As the money, men and time available were insufficient to give the region as intensive coverage as in previous years, it was necessary to employ a higher rate of coverage per man day. A small number of diseased trees may have been missed, but it is not believed that a dangerous quantity remain undetected, presuming that subsequent years' scouting would locate the trees before they became sources of spread. In order to compare directly the 1940 scouting results with those for 1939, sixty-five areas averaging seven square miles each and scattered through the entire major region were chosen at random representing the average and the extremes in numbers of diseased trees found during 1939. These same all selected areas were scouted just as thoroughly as in 1939 and possibly more so. A review of the results secured in diseased trees on these areas this year as compared with those found on the same area in 1939 shows a reduction of sixty per cent for 1940.

A comparison of the results of scouting in the entire major region for 1940 with the same region in 1939, shows a reduction of sixty-five per cent. This would indicate a possible failure to detect five per cent of the diseased trees over the entire major region, amounting to approximately 190 trees. Furthermore, estimates by field supervisors indicate that scouts saw about ninety per cent of the elms in the major region of infection, eighty-five per cent of the elms in the border zone, and fifty per cent of the elms in the territory of the advance zone covered.

Among some, there is a belief that in areas of known infection, a large proportion of elms are diseased. This is far from the actual case. In the major region of infection an analysis of the results of this year's scouting shows that of the estimated elm population for the major region of infection only one elm per 8,000 is diseased. For that portion of each State known to contain the infection, this means one diseased elm per 4,000 in New Jersey, one per 13,000 in Connecticut, one per 16,000 in New York, and one per 19,000 in Pennsylvania.

The general improvement in the Dutch elm disease situation, resulting from the Department's campaign since 1933 is shown graphically in the maps on page 23.

During the period 1933 through the fiscal year 1940 the work area was scouted on an average of twice during each foliar season and a tremendous amount of elm sanitation work was carried on during the winters. Over 2,600,000 elms have been sampled for symptoms and over 400,000 were recognized as suspects requiring culturing in the laboratory. The sanitation work was directed to the removal of trees infested or likely to become infested by the bark beetle carriers of the Dutch elm disease fungus; trees which, while not known to be diseased, contained symptoms that created a definite scouting problem; and finally trees dead or dying from some unknown cause which might be the Dutch elm disease but which had not given positive cultures. In these sanitation operations 4,250,000 elms have been removed. Beetle-infested material has been pruned from 250,000 elms, nearly 700,000 elms have been chemically killed, and over 1,250,000 elms have been removed from certain areas in selective operations designed to improve scouting and at the same time favor the remaining tree growth.

From its beginning, the cooperative effort to eradicate

the disease has been largely supported by funds allocated from various emergency appropriations provided primarily to give employment to men on relief rolls. Only \$2,400,000 has been appropriated to the Department of Agriculture for operations to combat the disease and about \$1,380,000 appropriated by the several States involved and cooperating with the Department. These funds provided through regular appropria-

tions have been supplemented by allotments of nearly \$20,000,000 from emergency relief appropriations. The future of Dutch elm disease eradication is neither very discouraging nor extremely bright. It will require several years of adequately supported work to determine with any real assurance of positiveness the limits of the infection, if it is spreading, and whether the spread can be checked and the disease eradicated. The main problem consists of locating the infected trees. This has been done by scouts looking for symptoms of the disease on elms. The symptoms are changes in the external appearance of the elms, principally wilting, yellowing or dying of the foliage. Such signs lead to sampling of twigs or other parts of suspicious trees in the search for brown staining in the wood. Sampling often requires that the scouts climb elms to cut portions from the symptomatic branches and presence of the brown discoloration makes it obligatory that the trees be considered suspects and be cultured.

This method of work has several inherent weaknesses. It is limited as to the time during which it may be done and the men able to do it satisfactorily. It is slow and expensive if performed intensively over the great region

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	TOTAL
CONNECTICUT				1	55	72	101	125	935	412	350	1,631
NEW JERSEY				740	4377	4,113	5,795	4,830	16,248	8,924	2,591	47,516
NEW YORK				77	2,427	2,255	1,740	1,274	1,321	1,287	724	11,308
PENNSYLVANIA									50	250	154	394
CONN. GUD LYAE					1	4	1	1	0	0	0	7
IND. INDIANAPOLIS					4	10	19	32	34	14	5	116
MD. BALTIMORE				1	0	0	1	0	0	0	0	2
DRUMSTICK						3	0	0	0	0	0	3
CUMBERLAND							1	0	0	1	0	2
N.Y. BINGHAMTON AREA										10	74	84
HANCOCK AREA											1	1
OHIO. ATHENS								1	3	7	6	17
CINCINNATI		1	0	0	0	0	0	0	0	0	0	1
CLEVELAND		3	4	1	2	75	0	0	0	0	0	33
HOCKINGPORT										1	0	1
PA. BUCKINGHAM AREA											1	1
SUSQUEHANNA AREA											4	4
WILKES BARRE AREA											41	41
VA. NORFOLK					1	2	1	0	0	0	0	4
PORTSMOUTH						1	0	0	0	0	0	1
W.VA. WILEY FORD								5	1	0	0	6
TOTALS FOR YEAR		4	4	820	6,867	6,486	7,657	6,268	18,152	10,786	3,931	
GRAND TOTAL TO DATE		4	8	825	7,695	14,181	21,858	28,106	46,258	57,044	60,975	60,975

where it is required. It must be repeated year after year in the same region. It is incomplete as a means of detecting all diseased trees because the pathologists of the Department of Agriculture have determined that diseased trees do not always show external symptoms. Their research discloses that some trees may be infected and possibly may never show external symptoms. It is fortunate that these trees containing hidden disease are by the nature of their infection unlikely to become sources of spread of the fungus unless and until they develop symptoms. Furthermore, research by the pathologists indicates that the fungus slowly dies out in trees that do not express its presence by symptoms.

These findings do not mean that the disease is any less serious. They do indicate, however, that new procedures may be necessary. Present weaknesses in the effort to combat the disease may be strengthened by research and improvements. Some progress has already been made through the discovery that nonsymptomatic elms may have the disease. Information regarding this condition is in itself a relatively recent advance. Changes in scouting procedure have been developed to meet the situation and particularly so since the discovery of diseased trees in new locations has expanded the work area without compensating increases in funds. This has been in the line of speeding the rate of covering the area scouted to a considerable extent but with some loss in the intensity of the work.

It is believed that the scouting work now being done is locating each year almost all of those diseased trees which might constitute sources of spread of the disease during the year to healthy trees. Such work, however, is falling short of the objective of eradication. The program should be strengthened sufficiently to assure that the number of diseased trees in the major region is kept to a minimum until the outer limits of this area are accurately defined. If spread can thus be checked, scouting and eradication efforts should slowly contract the region where the infection occurs, enabling the use of more intensive scouting to locate the last diseased trees. Light rapid scouting over the past infected territory and throughout a border zone should discover any smoldering fires of disease arising from undiscovered infected elms possibly nonsymptomatic at the time of earlier examinations.

As already stated, the operations have so far been supported largely from relief appropriations. While the administrators of the relief agencies have usually cooperated as fully as possible within the limits of the regulations as to use of emergency money, nevertheless there are handicaps to the project from the use of such funds which apparently cannot be overcome. The security wage workers are subject to an eighteen months' limit of employment. This works against maximum results on the project through discouraging the men from considering the eradication job stable employment. In fact, the failure of the project to offer men any hope of retention in employment, development and future is a great handicap through lowered morale. Many referrals are not so good, especially of late years, and a considerable number fall short of really satisfactory performance. This in-

creases the need for supervision.

Another disadvantage existing in emergency money support is the location of man power on relief in relation to the needs of work on the project. The bulk of relief cases occur in the heavily populated urban areas and the availability of men employable on security wages decreases away from such centers. The project requirements are the reverse, with work increasing in the rural sections away from the metropolitan area.

There is likewise a time factor that is important in Dutch elm disease eradication. Funds should become available not later than the first of May, in order to provide for scouting during the best part of the season. Although the conditions that control the appearance of the external symptoms of the disease, on the basis of which scouts climb and sample trees, are weather controlled and hence irregular, it is usually desirable to commence scouting sometime between May 30 and June 15. Prior to scouting the men to do the work have to be secured and trained. In 1940 it was not until late June that the Agricultural Bill passed, and July before WPA fund allotments came through.

The effectiveness of the scouting this year was high although very late in starting and conducted on considerably less than the needed financial support. This was achieved principally because in 1939 a considerable body of scouts were trained and a number of these were still available for employment in 1940. This was fortunate but cannot be expected every year.

In New York the money was available July 12 but the State WPA Administrator refused to grant the intermediate pay rate for scouts, hence the men were returned to duty as unskilled laborers on July 29. This difficulty in New York proved a serious one, as it became necessary to adjust the program of work for the State so that what scouting was done could be done by laborers. The usual system of locating symptomatic trees, climbing and sampling them, had to be largely discarded, as it would have been dangerous to place full reliance for locating and climbing suspicious trees on men paid the same rate as the laborers who felled trees and burned them. Thus the WPA scouting work in New York was less efficient than elsewhere.

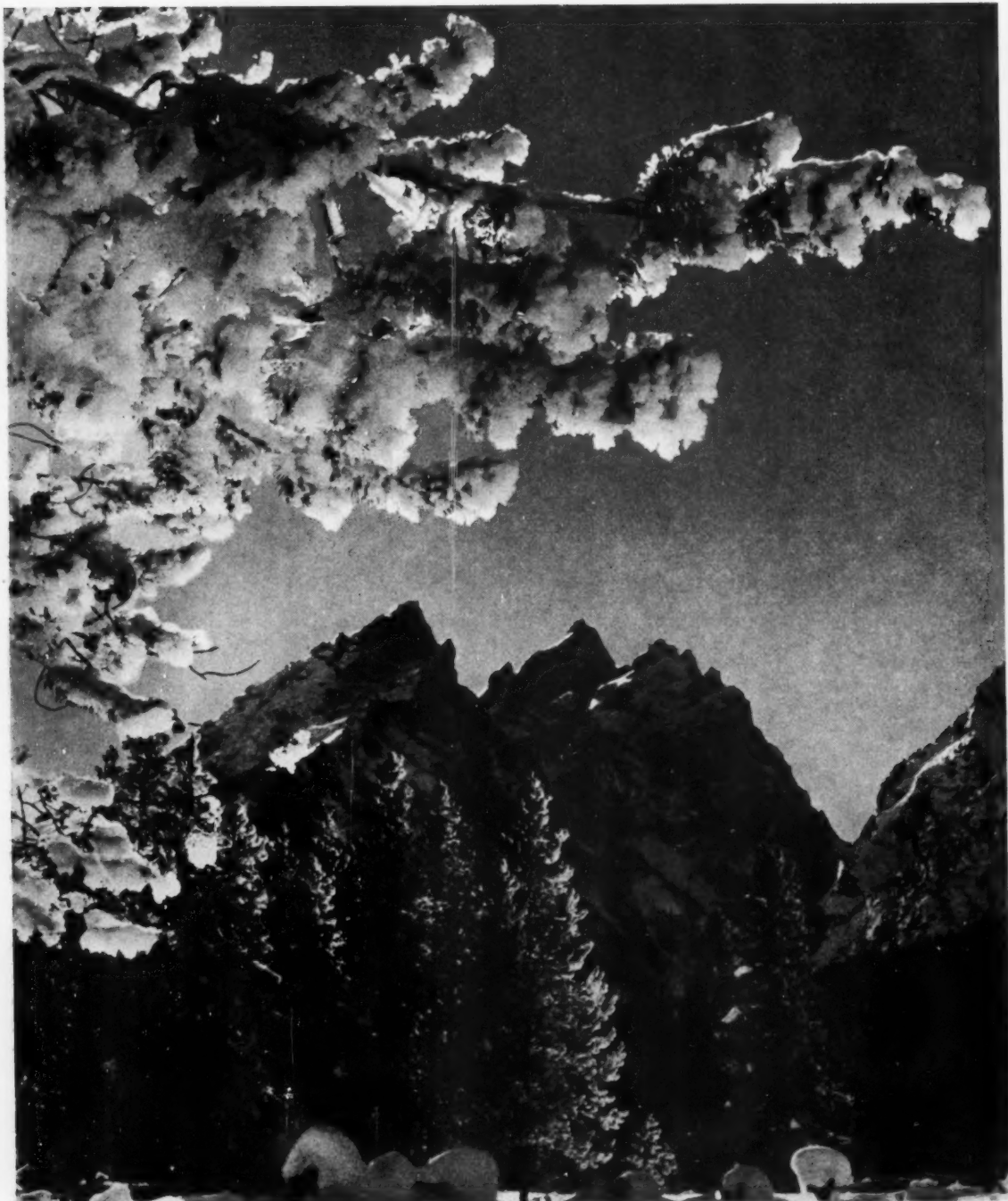
These are some of the handicaps present in conducting Dutch elm disease eradication work on emergency money. Such funds are better than none, however, if in sufficient quantity and if a sufficient amount of regular money is appropriated with which to fill the gaps in the program created by the restrictions on the use of emergency funds.

It cannot be stated that the Dutch elm disease is being eradicated in the major region at this time, although the results of the last three years' work have been noteworthy. The campaign to date has been waged as vigorously as possible but under the handicap of a too small regular departmental appropriation with the large deficit made up by emergency money. To reach a sound conclusion on the possibilities of eradicating this disease in the United States a fully financed program should be conducted for five years and the conclusion based on the results obtained.

THE 66TH ANNUAL MEETING

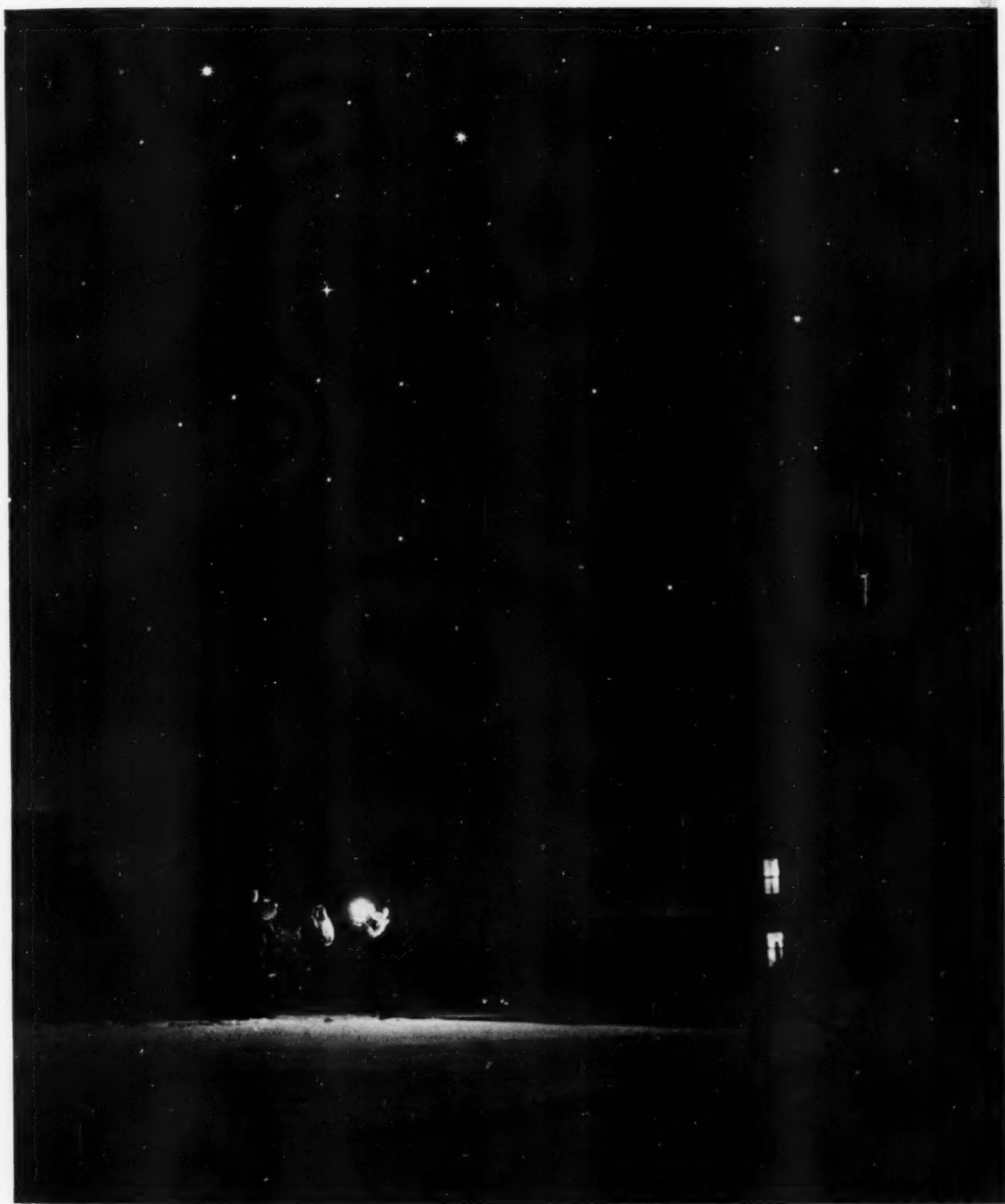
Plan now to be in California in April for the 66th Annual Meeting of The American Forestry Association. The place is Los Angeles—the time April 15, 16 and 17, 1941. Marking the first time this national organization has held its annual session on the Pacific Coast, a special program in keeping with the occasion is being developed. Interesting field trips are being arranged—trips that will make it possible for those attending the conference to enjoy the rare beauty of Southern California in April. Plan now to attend.

IN THE WINTER WOODS



© Roland Wolfe

"When the pine trees crack like little guns,
In the silence of the woods."



Photograph by Carl A. Taylor



SERENELY NIGHT DESCENDS—

"And, from the boundless Source of Peace,
The stars look nightly down."



The charm of a period living room in a modest home, where the fireplace end of the room has been worked out in glowing panels, is further enhanced by the wood-beamed ceiling. And the flexible cost range of wood for interiors brings it within the reach of the average home builder

BEAUTIFUL INTERIORS OF WOOD

By HERBERT B. McKEAN

Photographs by the National Lumber Manufacturers Association

VISITORS to many of our fine old colonial homes are frequently impressed by the wood paneling employed to enhance the beauty and charm of the rooms. The type of construction used in those structures had long been considered the only method of using wood for interior walls. During the last fifteen years, however, plywood has become a prominent wall finish and recently a new development has appeared on the market known as "standardized board paneling." There are, then, three distinct types of wall covering of wood.

The old, well known type panel as used for centuries in this country and in Europe is very familiar. It is made up of a framework of boards an inch or more thick. The spaces in this framework are then filled with panels of thinner boards, held in place by a mold nailed to the framework. Frequently the panel has beveled edges. This type of paneling produces a depth and warmth which cannot be equalled by any other type. Besides the richness and luxuriousness of these panels they also have a very practical value which cannot be attained as perfectly in any other wooden interior. Use of the mold to hold the panel in the framework allows considerable swelling and shrinking of the different parts

of the assembly with no perceptible distortion and at the same time no unsightly cracks appear. If the wood is finished in a relatively dry condition there will never appear any lines of bare wood around the edges of the panel. In finishing these panels, stains and varnishes are most common so that the beauty of the natural color and grain of the wood can be displayed. Painting, however, is used, producing splendid effects, particularly when ornate millwork is used to enhance the beauty of the room.

For the average individual there is one striking disadvantage to this type of interior and that is its expense. Since each room in a house is "individual," these panels must be made to fit a particular room and therefore, their manufacture and installation is a custom job.

Plywood as a wallboard has been in existence for more than a decade. In general it is available in sheets four feet wide and from eight to sixteen feet long. Sections made of three or five plies are most common. Early installations of plywood were not as attractive as those now possible. Formerly the method of application was to nail the sheets to the wall and to cover the cracks between pieces with batten. The entire wall and ceiling was cov-



Southern Cypress Association

Detail of fireplace treatment in a formal room where the wood panels of clear boards were chosen for the natural beauty of the grain

Living rooms loom large in planning beautiful interiors of wood, and certainly breakfast would be a delight served in such a wood-walled nook as this



This wood-sheathed, period living room, done in the simplest style, authentically reproduces in its fireplace and cupboard treatment, the modest detail of the early New England home

ered in this way and then painted. The battens in particular prevented this method from becoming very popular. More recently plywood panels have been made with "V" joints which do away with the batten. There has also been developed a sunken batten which produces a smooth surface. Furthermore, more decorative woods are being used for the surface ply, permitting a natural finish, which adds still more to the attractiveness of the finish.

At the present time plywood has certain advantages over other types of panels. It is inexpensive compared with the old wooden interior. Many retail yards handle various types of plywood so that it is readily obtainable. Application is easy. Only the surface ply need be of high quality, a fact that decreases the cost. The chief disadvantage—the use of battens—has been eliminated. There is, of course, the drawback that certain types of plywood do not yet have as beautiful a figure as solid wood. Careful selection, however, can overcome this.

The expression "How beautiful that paneling is, but it must be expensive" is frequently heard. This statement is quite true with reference to certain types of paneling, but is not the case when "standardized board paneling" is considered. Solid board panels are now available at a cost closely approximating that of plaster. "Standardized board paneling" is a product of sawmills manufacturing, along with their other products, one inch boards which can be used for paneling. These boards are regular "run of the mill" production and where any further fabrication is required to make them fit the place where they are to be installed, it can be easily accomplished "on the job." It might be said then that this type of wood interior has taken wood paneling out of the "Cadillac" class and put it in the "Chevrolet" class.

Standardized board paneling, strictly speaking, is not paneling in the sense that rectangular areas are set apart by some type of framework such as comes to mind at mention of the word "panel." This new type of wood interior arrives on the job as boards, surfaced one or two sides, and edges matched by any one of several types of joints, the most common being "V" or tongue and groove joints. In addition, a piece of tongued and grooved mold can be placed between each board with the surfaces of the boards and the mold flush. When properly fitted, this strip amply allows for expansion of the boards. Furthermore, some people feel that this mold adds to the pleasing appearance of a room.

At present there are five general designs or methods of standardized board paneling being used. They are: (1) vertical boards extending from floor to chair rail height—thirty to thirty-six inches—with plaster above; (2) horizontal boards from floor to chair rail height; (3) vertical boards extending from floor to ceiling; (4) horizontal boards from floor to ceiling; and (5) horizontal boards to chair rail height and vertical boards from chair rail to ceiling. Five styles are not a great many, of course, but to these patterns can be added at least as many methods of finishing, plus a wide variety of woods.

Along with the development of standardized board paneling has come the recognition of "character marks" as a source of additional charm in wooden interiors. We have been so long accustomed to clear boards for positions where a pleasing appearance is desired that the beauty of stain and mineral breaks in wood has only recently been recognized. In many cases knots and other marks are a decorative feature rather than a blemish. These physical peculiarities of wood not only add distinction to lumber for paneling but they also make wood undesirable for certain high priced uses, so that wood containing "character marks" may reasonably be

expected to cost less than clear boards.

It has been mentioned that since board paneling is not custom work it is less expensive than the older type of paneling. Compared with plaster, standardized board paneling costs approximately the same. For example, if the paneling boards are purchased at \$45 a thousand board feet, it will cost only about \$3 more to panel a room fourteen feet by twenty feet than to finish it with plaster. This figure is based on plaster and lath at seventy-five cents a square yard and in the case of both plaster and boards the figures are about the minimum at which either could be purchased. An additional economy is effected in that when the wood surface is once finished it needs very little care thereafter—wiping with a cloth will remove dirt and refinishing is seldom if ever necessary. The price of plywood closely approximates that of standardized board paneling.

Recently there has come on the market a new type of wall board. It is made by gluing a very thin sheet of veneer to a plank of pressed bagasse fibre. The veneer may be walnut, mahogany or avodire. These so-called planks are made in widths of six, nine and twelve inches and lengths of eight or ten feet. The thickness of all planks is one-quarter of an inch. A unique and commendable detail is the absence of visible nails or nail holes after panel installation. This feature is made possible by the use of beveled shiplap joints. The under half of a joint is nailed to the wall and then this position is covered by the other half of the joint, which, of course, is a part of the adjacent board. The second piece is held to the first by means of a special adhesive. An oil-wax finish is applied at the manufacturing point so that as soon as the boards are in place the wall is completed, producing a resemblance to solid boards. This product gives a pleasing effect and is adapted to solid surfaces such as plaster or boards. It is not adapted to nailing directly to the studs. In new construction this limitation may be a disadvantage, but for remodeling it can be used over other wall materials, and is thin enough so that it is not necessary to change door and window casings.

It is generally recognized that the finish of the wood has a great deal to do with its beauty. For paneling, natural finishes are most desirable and once applied can be kept clean with very little effort and do not require continual repainting or repapering. A little wax or furniture polish will restore the lustre if it has become dull.

Houses in which the walls are made of wood are known as "dry-built" houses. The term implies the elimination of wet plaster in construction and the difficulties encountered in the use of plaster. Dry-built houses eliminate the danger of cracks occurring as plaster dries or the houses settle.

A very important factor in modern house construction is heat insulation. In this matter wood is outstanding. One inch of wood is equivalent in insulation value to three inches of plaster and lath or five inches of brick. Furthermore, wood for its weight is stronger than these materials. In fact, it is one of the few substances used commercially for heat insulation that embodies high strength properties. The house with wood paneling, therefore, will be stronger and better insulated than the ordinary house.

Occasionally wood has received a "black eye" through the use of poorly prepared material. If wood is not sufficiently seasoned, there will soon appear unsightly cracks between boards. If it is too dry, in humid weather it will take on moisture causing it to swell and sometimes buckle. Wood purchased from reputable manufacturers, however, can be depended upon for a long period of satisfactory service.

EDITORIAL



THE CASE OF THE ELMS

MUCH encouragement is to be drawn from the Dutch elm disease situation as reported by Mr. E. G. Brewer elsewhere in this issue. After six years of warfare upon the disease by federal and state agencies, during which pessimism as to possibility of eradication has taken root and grown, Mr. Brewer's report comes as stimulating news. It should establish confidence that the disease can be dealt with successfully provided Congress and the public will give the eradicating agencies the support necessary to finish off the job.

The facts, as given by Mr. Brewer, we think, justify greater optimism than he himself expresses. He, however, is a member of the U. S. Bureau of Entomology and Plant Quarantine, which in a sense is the general staff of the eradication army. These men traditionally are overly conservative in making predictions when dealing with serious outbreaks of plant diseases or insects, particularly when the disease or insect is new to this country and its behavior not fully known. Furthermore, they do not know from year to year how much money Congress will provide them for continuation of campaigns to meet emergencies. The handicap of this uncertainty in planning and carrying forward the work to save the elms is strikingly brought out in Mr. Brewer's article.

But back of his understandable conservatism as respects ultimate eradication, his factual presentation shows: (1) that there has been a marked decrease in the intensity of the disease during the last three years in the major area of infection; (2) that in the same area there was a reduction of sixty to sixty-five per cent in the number of trees showing infection in 1940 as against the number in 1930; (3) that at most of the points of outlying infections, no trees newly infected have been found for several years. Here it would seem are facts to justify saying that the control forces now have the upper hand and that with adequate funds for continuing the work, the disease not only can be controlled but eventually eradicated.

The crux of the situation now is in the preceding sentence—adequate funds to continue the work. Upon that point will turn whether the elm throughout its American range will be saved or will succumb to a disease known to be totally destructive once out of control. Here the outlook is less bright because of fiscal demands for national defense, forced economy in non-defense

activities of government and a shrinkage of relief appropriations. To date, the elm disease work has been underwritten largely by relief funds—WPA labor, which while not well adapted to the type of work involved, nevertheless has made it possible in the absence of other help to hold the disease in check. If this source of man power fades away or is greatly reduced, the Department's regular appropriation for the work will be wholly inadequate to cope with the situation. This means that all the money spent to date—some \$25,000,000—will have been spent in vain, the American elm will be marked for death and citizens and communities throughout the country will be subjected sooner or later to heavy expenditures in removing dead trees from their properties.

Considering the value and meaning of the American elm to our country, and the fact that the fight to save it is on the way to being won, it would be a national calamity to abandon the fight now on the plea that we cannot afford spending a few million dollars more at this time. It is true that in the light of national defense needs, there are many federal activities that can and should be set aside for the time being, but stopping the elm disease is not one of them. The disease brooks neither temporizing nor delay. Abandon the battle for even one season and most certainly all will be lost.

It is urgent, therefore, that the American public voice to the Administration and to the incoming Congress a strong demand that adequate funds be made available for continuation of the control work during the next year. If regular appropriations and WPA funds cannot be provided, other sources should be drawn upon. There are the CCC and the NYA organizations, both of which could supply a better and more stable type of labor than WPA for Dutch elm disease work. Both organizations are seeking to train men for various types of work. One wonders why they have not trained a few hundred men each year and thrown them into the fight to save the elms. Certainly the CCC with its broad field of conservation training could select from its ranks a mobile force of young men well qualified for the type of work called for by the Dutch elm disease project. There are other possibilities within the rim of the government set-up but unless the public demands that they be found and employed, the war for the elms will surely be turned from victory to defeat.



MICE AND CONIFERS

By ROBERT ISAAC

LANDOWNERS, nurserymen, foresters, watershed managers, and others interested in the growing of conifers for business or pleasure should be on the lookout for possible damage to their plantings from the inroads of the lowly meadow mouse and its relative the pine mouse. The meadow mouse (*Microtus*) and the pine mouse (*Pitymys*) are fond of the bark and roots of young conifers, and in places of heavy infestation of these rodents, serious damage and heavy loss may occur. This was proved in a recent survey made in Connecticut in cooperation with the University of Connecticut.

Individual losses running into the thousands of dollars were reported during this survey. In one tree nursery 7,200 Scotch pines eight to ten years old were killed by the tree-girdling mice; in another, forty-five per cent of a hemlock plantation consisting of 7,700 trees eight to twelve feet high was destroyed; and a third suffered the loss of ninety-two per cent of a red pine planting of 3,000 eight-year-old trees. When the time and labor spent on the original planting and the cost of replacements are considered, such losses are not trivial.

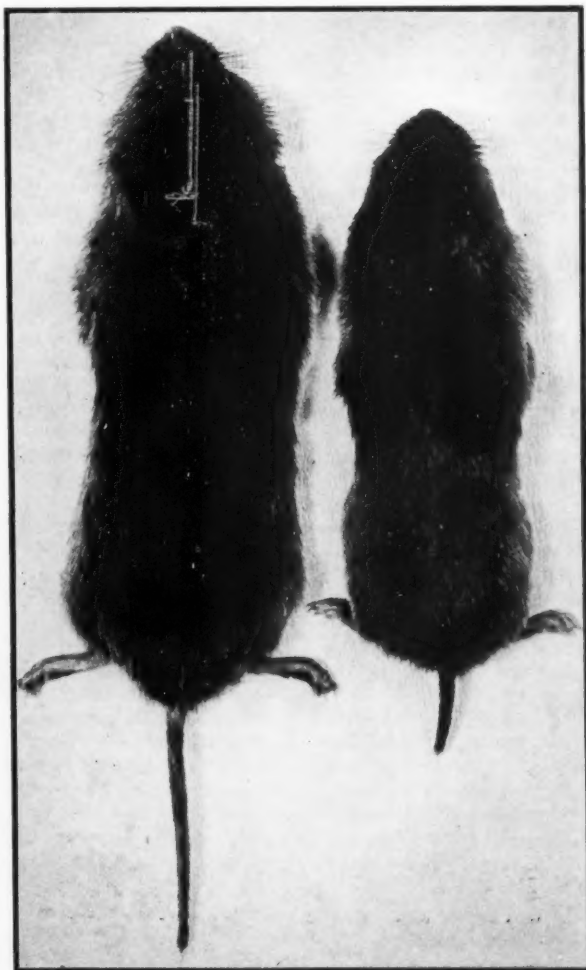
Although the pine mouse was responsible for considerable damage, the meadow mouse was by far the worse offender. This was probably due to the greater numbers of the meadow mice, but the pine mouse, on its optimum range, could be just as destructive. In the survey, it was found that the greatest losses occurred to plantings in which the trees were one to ten years old. Occasionally an older tree was damaged by the mice, but as a rule the heavier bark and larger trunk diameter of the older trees were too much for the mice.

In mixed plantings of the conifers the mice showed a preference. In areas in which Japanese red pine (*Pinus densiflora*) and white pine (*Pinus strobus*) were planted together, the white pines were never touched even though the mice were plentiful under both species. Where Scotch pine (*Pinus sylvestris*) and red pine (*Pinus densiflora*) were mixed, the red pines were never girdled. Alpine fir (*Abies lasiocarpa*) was preferred to spruce (*Picea*). In a mixed planting of Canadian hemlock (*Tsuga canadensis*), red pine (*Pinus densiflora*), and white pine (*Pinus strobus*) the mice exhibited a preference for the hemlock, not a red or white pine being touched. Of all the conifers examined, the hemlock and

the Scotch pine ranked highest on the preferred list of the mice.

The only severe damage to a white pine planting was the result of a pine mouse infestation. This was root damage and was discovered only after the terminal growths began to wilt. White pines were seldom girdled by meadow mice. The conifers most heavily girdled or damaged included the following: Japanese red pine (*Pinus densiflora*); Scotch pine (*Pinus sylvestris*); White pine (*Pinus strobus*); Austrian pine (*Pinus nigra*); Carolina hemlock (*Tsuga caroliniana*); Canadian hemlock (*Tsuga canadensis*); Alpine fir (*Abies lasiocarpa*); Douglas fir (*Pseudo tsuga taxifolia*), and Colorado blue spruce (*Picea pungens glauca*). In nurseries, arborvitae and pink dogwood were also heavily damaged wherever mice were present. Black locust was also a favorite of the rodent.

Mouse damage occurs at the base of the trees and on the roots. It can be distinguished from that by other



The two girdlers—both adult males. The big fellow is the Meadow Mouse, the smaller one the Pine Mouse and they are both shown a little larger than actual size

rodents by the incisor tooth marks left on the tree, but trails in the grass or under the snow, or underground burrows are the best indication that mice are present. If the girdling is being done, it is the work of mice.

As the life habits of the pine mouse and those of the meadow mouse differ, it is possible to detect which species is doing the damage. Pine mice are more molelike in habit, and their girdling is usually done on the roots of the trees, where it may be unnoticed until the tree is too far gone to save. Meadow mice, however, spend most of their time on the surface of the ground and girdle the trees from the root crown upward.

Clean cultivation is not always a protection against mice. They travel great distances under the snow, and even though the plantings may be clean-cultivated, the mice may move into the plantations from adjoining meadows and mouse harbors. In one instance, noted in the survey, a drainage ditch running through a nursery provided cover and living conditions for meadow mice and cost the nurseryman an estimated \$5,000 in mouse damage to his hemlock and Colorado blue spruce plantings. The nurseryman had felt that he was well protected because he kept his plantings clean-cultivated.

Mouse damage to trees is not new, but it is surprising



Severe root damage to White Pine—the result of a pine mouse infestation

how few conifer growers appreciate the importance of controlling these rodent pests. In the past, strychnine has been a standard poison used in control but experience has shown it to be ineffective for controlling tree girdling mice. When, in 1936, mice damage to young trees in New England became especially severe, the Bureau of Biological Survey (now the Fish and Wildlife

Service) placed an investigator in the field to study the control problem and develop more effective methods, if possible.

Out of these studies the Service has perfected a new control procedure which it considers an advance over old methods. It involves, however, use of a dangerous poison, unless properly protected, and a rather specialized application based upon a knowledge of the poison and the life habits of the field mouse. For this reason, and pending further tests and development of the method in other parts of the country, the Service is making available the new control method only through supervisory instruction of its field agents. Growers of young trees, therefore, faced with the field mice problem who are interested in this new method of control should contact local or regional officers of the Fish and Wildlife Service, U. S. Department of the Interior, or write that agency at Washington, D. C.



SCOTCH PINE

WHITE PINE

COLORADO BLUE SPRUCE

These girdled trees are typical of the work of the Meadow Mouse—by far the worst offender, possibly due to its greater numbers. A survey showed that individual losses ran into thousands of dollars

The Cedars of Lebanon--Then and Now

(Continued from page 20)

agriculture first began on the alluvial plains of the Nile and Mesopotamia. And we suspect that rain agriculture developed very early if not first, on the slopes of Phoenicia which lay strategically between these two great treeless plains where civilizations rose early and rapidly. On these lands, stripped of forests of cedars of Lebanon, and cultivated for food crops, we suspect that early man first encountered the menace of soil erosion and was the first to find the solution for sustained cultivation of sloping lands by building rock wall terraces.

The earliest recorded reference to agricultural terraces is in an inscription of Thutmose III, on the wall of a temple at Karnak. He records finding wheat on terraces at Arvad, not far from the Lebanon, in 1472 B.C. This would indicate that early in their history, the Phoenicians replaced forests with food crops on mountain slopes, possibly as a response to increasing population pressure. In time there was built a most amazing panorama of rock wall terraces throughout ancient Phoenicia — more extensive even than those of the ancient Inca civilization in South America.

As one stands upon a summit of the Lebanon Mountains and looks out upon a vast phantasmagoria of valleys, slopes, and ancient terraces in various stages of breakdown, resembling vast stairways, with villages located on high ridges and in deep valleys, one is overcome by the immensity of a tragedy in land use. The drama is still enacted by populations oblivious to their heritage or to their part in the tragedy. Man's occupation of this area through more than 5,000 years has not been a happy success or adjustment of a people to the land. True, here and there one finds a delightful and satisfying area where ancient terraces have been maintained throughout 4,000 or 5,000 years and where the soil is still productive, maintaining relatively prosperous villages. But such areas represent a minor percentage of the region.

Terraces in all stages were noted from the air. Rock terraces lay outlined on the rock foundations of the hills, scarcely recognizable when going over them on foot. In such cases, the terrace had not been kept in repair and every vestige of soil had been washed from the slopes. Some terraces were partly broken and the soils are still eroding. On others, an erosion pavement had formed which tends to check further excessive erosion. Some of these were planted to orchards and vines or small plantations of nut pine, *Pinus pinea*.

Ancient Phoenicia appears to have been the mother country of terraces, which were carried around the Mediterranean world by the Phoenician colonists; to North Africa, Sicily, Cyprus, Italy, and southern France. Recently discovered evidence

suggests the spread of Phoenician culture and its terraces even to distant Rhodesia.

The importance of North Africa as the granary of Rome during the Empire may be due to the spread of Phoenician measures of soil and water conservation worked out on the slopes of the Lebanon Mountains at the expense of their forests. Carthage was a Phoenician colony and when Scipio destroyed it in 146 B.C. he saved twenty-eight volumes by the Carthaginian agricultural writer Mago, who was recognized by the Greeks and Romans alike as the foremost authority on agriculture in the Mediterranean world. His works were translated into Latin and are cited by Roman writers such as Columella, Varro and Cato about the beginning of the Christian era. Roman rule fostered Phoenician traditions of soil and water conservation.

In the mother country of old Phoenicia is written the indelible record of the stupendous human effort of generations of men in the building of rock wall terraces. In the vicinity of Beit Eddine, east of Beyrouth, Lebanon, terrace construction early reached its maximum development. Terraces now extend row upon row from the valley floor to the crests of ridges. They are equivalent to a solid wall up to 2,000 feet high. At modern American wages and hours, the cost of building rock wall terraces alone works out at \$2,000 to \$4,000 an acre on slopes from fifty to seventy-five per cent. This is a heavy price to pay for the conservation of so little land. We can only admire the tillers of the soil who since Phoenician times, probably 4,000 years, have conserved the physical body of the resource for continued use today. Regardless of economics, the important fact is that the soil remains a resource and supports a population. Such is the length to which a people will go to conserve its land when foresight and necessity combine in a long range policy of land conservation.

How can we make a people realize that the daily acts of the tillers of the soil have everlasting significance for the future? Not until a people comprehend the processes at work in the soils and waters of the land, and take effective steps to work with natural forces to maintain the native fecundity of the earth and put land to uses for which it is suitable — not until then may we expect anything but tragedy in man's relation with the earth. At last we have learned to read what is written in a landscape under long use, and in it we discover a few vital truths for the salvation of a civilization. Exploitation is suicidal; destruction means extinction.

Even now, more than half of the human race is engaged in a life and death struggle over land and access to its products. One part is seeking by force to take control of the lands and liberties of other peoples, and the other part is defending its homes, lands, and liberties with its

lives. It is an economy of exploitation fostered by privations or greed for power that has brought the peoples of the earth into conflict. The age old formula of destroying the antagonist is being used to settle these conflicts. But equipped as we are with power over and understanding of forces of nature, metallurgy, and chemistry of high explosives, we are capable of destroying the works and achievements of mankind, human populations — military and civilian — as never before in the history of the human race. We are capable of destroying ourselves; even now civilization is committing suicide in the Far East and in Europe.

The ancient formula of destruction does not settle conflicts; it only pushes the problem away, to come back again in more insistent and terrifying proportions. If civilization is to be saved from a long decline, society must be born again out of an economy of exploitation into an economy of conservation in its fullest sense. If all the energies and resources of the human race now given over to destruction and the preparation for destruction were devoted to making this old earth of ours fruitful and to making its fruits and products available, it would be possible to supply not only ourselves but the entire human family with more than enough for all its needs.

But in a world of opportunism and national piracy, conquest and pillage, we must be prepared and ready to defend this land of promise from any and all aggressors. We must safeguard our social structure from enemies within and moreover, we must protect the very basis of our existence — the land, its soils, forests and waters from wastage by erosion or otherwise. For sooner or later, peoples at war will become exhausted and weary of destruction; they may then perchance be willing and ready for a substitute — an alternative — a way out of this hellish business of destruction. Such a substitute, such an alternative, exists in the goal of conservation of human and material resources, when made real, that all may see and understand. How can we make the man of the field, who farms on the contour, who saves the blessings of heaven in the rain, and his soil from erosion, and the man of the street who depends on the farmer for his food, and the leaders of government — how can we make peoples see in these comparatively simple deeds their everlasting significance for the life of a nation and for the advance of civilization? An economy of conservation of material and human resources is the promise of the future against the barrenness of the past in its exploitation of peoples and the resources of the holy earth. In it is the principle of saving that which was lost; of making real to peoples suffering privations and misery, the possibilities of the earth for human welfare and happiness.

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Forest Service Names Kotok Assistant Chief

Edward I. Kotok, director of the California Forest and Range Experiment Station of the U. S. Forest Service, on December 4 was named assistant chief of the Service in charge of the branch of state and private forestry. He succeeds E. W. Finker, who, a year ago, resigned to become executive secretary of the American Pulp and Paper Association.

Mr. Kotok's new duties make him re-



E. I. Kotok

sponsible for a number of cooperative programs now under way between the Forest Service and state and extension foresters to improve forest management, fire control, and forest planting in the various states. The state and private forestry branch also directs the New England Forest Emergency Project concerned with forest fire hazard reduction and timber salvage following the 1938 hurricane, and the Prairie States Forestry Project.

Mr. Kotok is the author of numerous scientific publications, many of them relating to new developments which increased the efficiency of fire detection and control systems in California forests. His experience both in the technical development of fire control and in administration of cooperative fire protection work will be valuable in directing the Clarke-McNary Law program for federal aid in forest fire protection, which comes under the branch of state and private forestry.

He is a native of New York, fifty-two years of age, and a graduate of the College of the City of New York, where he received the degree of bachelor of science in 1909, and the University of Michigan, from which he was graduated with the degree of master of science in forestry in 1911.

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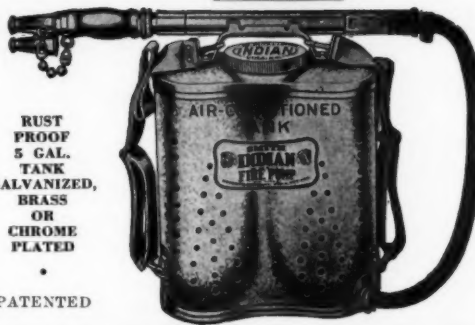


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Advertising Farm Forestry

"SAY, BILL, that's a keen looking farm forest you're building over there."

"How do you like my little pine plantation?"

"Shucks, I've got first place cinched!"

"Hey, Joe, help me get this doggone electric train started."

"Jim, that piney woods hog you've got looks sure enough real."

On the morning of October 7, at Lufkin, Texas, you would have heard the "Bills," "Joes" and "Jims" putting out similar bantering retorts as they sweated, hammered, joked, but worked like beavers at their exhibits on farm forestry.

These boys, representing the 4-H Clubs and Future Farmers of America, Chapters of East Texas, were undertaking the biggest show ever staged in the state's piney

to several of the displays. Other exhibits included tree planting, pruning, small farm sawmills, wood preservation, and growing fence posts.

The effectiveness and appeal of back-board panels brought out unique ideas, also. Some made letters out of wood, others used photographs, while one presented an oil painting of a farm forest. Attention was focused on several booths using ruby bulbs to portray forest fires; another club made use of a toy electric train.

The judges were represented by a forester, newspaper editor, industrial engineer and chamber of commerce man. They scored each booth individually and separately, basing their decisions on presentation of the theme, conveyance of thought to the layman, and general attractiveness.



Winning farm forestry exhibit at the Texas Forest Festival was staged by the Gregg County 4-H Club

woods section to advertise the benefits of growing timber as a profitable crop on the farm.

The setting was the Texas Forest Festival, held each fall in Lufkin and devoted to advertising the value of Texas forests. The basis for the exhibits was a contest planned by the Texas Forest Service with the Texas Forestry Association, the Texas Forest Festival Association and the American Forestry Association as cooperators.

Thirty-two exhibits competed for the awards. They covered all phases of farm forestry. A few dealt with the place of the woodlot on the farm as a whole; comparisons between burned woods and protected woods was a popular subject, as was clear-cutting compared to selection systems. Some of the boys showed the value of fencing longleaf timber against hog damage; the dollars and cents side of growing timber as a crop was brought in-

First prize was awarded to the exhibit prepared by the 4-H Club of Gregg County.

Prizes included \$350 in cash, forestry equipment and plaques. The American Forestry Association presented the winning Gregg County 4-H Club with a beautiful plaque, plus a medal to the club leader. This plaque will be inscribed and kept by the club for one year when it will be passed on to the 1941 winner.

The contest represented the work of about a thousand East Texas farm boys. Just the mere fact that they had their hand in making the exhibits is a big point because people learn by doing. Then, too, an estimated 75,000 people saw the exhibits. Surely some of them have been impressed, must have started thinking along the line of better forestry. Yes, farm forestry was really advertised in East Texas this fall.

Keep the Home Fires Burning

By EDWIN A. MASON

I HAVE gone back to the fuel of my ancestors. In so doing I am actually practicing sound conservation—and saving money into the bargain.

October frosts made me think of heating my new work room, but wood as a fuel was the last thing I thought of. Before I remembered there was heat aplenty in the wood that ought to be chopped out of the mixed second growth stand by the high pasture, I actually invited being pestered by salesmen for piped gas, canned gas, oil and coal.

I became interested in one of the new wood burning stoves that you only have to fill once every eight to twenty-four hours. Why burn fuel brought in from goodness knows where, costing goodness knows how much, when your own wood lot would actually be improved by cutting out some of the inferior growth?

The express men told me when they delivered my stove that it was a pretty substantial affair I had bought. Made of cast iron, its three-hundred-odd pounds was evidence enough that here was no plaything, but a heater functionally designed to be unobtrusive — and to heat. As we ripped off the packing case a pretty conventional square stove, standing a little less than three feet high, came into view. It was only when we peeked inside through a lid on top and a door at the bottom of the front, that it became obvious that here was something radically different.

These stoves really burn wood—they almost burn the smoke. They burn wood so completely that after running twenty-four hours you only have a handful of ash. On my stove you pull up the lid on the top. Here you get your first surprise. Instead of one lid, you find you have lifted two, for the lid to the inner magazine where the wood goes, comes up with the outside one. Firing the stove is a normal procedure, except that you load the magazine clear to the top, packing in the wood as closely as possible. With both lids closed and the only damper on the stove opened, this is what happens:

Air from the room comes through the damper into the ash pit. It then passes through specially designed openings where it is preheated. From there it is injected into the combustion ports, where it joins with the wood gases being expelled by the heat of the stove out of the wood in the magazine. This mixture of air and wood gas is completely burned in the combustion ports. The hot air and residues then pass up the front of the stove; then over the top of the magazine, and so out to the flue. In this way the air allowed to come in through the damper regulates the amount of heat generated, which in turn regulates the amount of wood gases distilled from the wood in the magazine, giving perfect control.

Eventually all the gases are expelled from the wood. What is left is charcoal. This continues gradually to be consumed over a long period, giving off a uniform heat.

It is a good bed of charcoal I usually

find in my stove every morning. After being shut up tight for fifteen hours, the room still has the chill taken off even on the coldest mornings. In no time at all heat from the reservoir of charcoal makes the place cheery and warm.

These new stoves do not stop at just giving you more heat from less wood. They will burn trimmings from the sawmill, or thin stuff from loppings or from "weeding" operations carried on to improve timber stands. In fact mine does a better job on small stuff.

Foresters are behind this new method of burning wood. Up in New England the 1938 hurricane taught that section of the country a lesson in wood utilization and marketing,—a lesson that Europe has known for generations; it is one all sections of America must learn.

As forest management comes to our woodlands, plenty of material will be made available for heating purposes. It will be mostly material now wasted. It will be material made available as the foresters go to work on the timber stands of the nation, thinning and pruning in an endeavor to keep a steady flow of high grade lumber into manufacturing channels.

EDITOR'S NOTE — Information regarding these new types of wood-burning stoves will be gladly furnished by The American Forestry Association.

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Colorado Blue Spruce				Douglas Fir (P. taxifolia)			
12 to 15 in. XX	\$6.00	15.00	125.00	10 to 18 in. XX	6.00	17.50	110.00
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12 to 15 in. XX	5.00	13.00	100.00	12 to 15 in. XX	10.00	37.00	290.00

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	25	100	1000		25	100	1000
Sugar Maple (A. saccharum)				Black Walnut (Juglans Nigra)			
12 to 18 in.		\$5.00	\$25.00	12 to 18 in.	\$2.00	\$5.00	\$25.00
4 to 6 ft. X	12.00	45.00	325.00	Tulip Tree (Liriodendron tulipifera)			
Paper Birch (Betula papyrifera)				12 to 18 in.		4.00	20.00
18 to 24 in.	3.00	8.00	45.00	2 to 3 ft. X	8.00	30.00	250.00
Red Bud (Cercis canadensis)				Red Oak (Quercus rubra)			
18 to 24 in. S	2.00	5.00	25.00	18 to 24 in.	3.00	7.50	50.00
2 to 3 ft. X	7.00	25.00		3 to 4 ft. S	5.00	12.00	75.00
White Flowering Dogwood (Cornus florida)				Pin Oak (Quercus pauciflora)			
12 to 18 in. S	3.00	8.00	40.00	12 to 15 in.	3.00	10.00	80.00
2 to 3 ft. X	8.00	30.00	250.00				

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After an icestorm — a good job for a tree man. These limbs should be properly and evenly pruned to protect them from future wind and ice storm damage

YOUR SHADE TREES

PRUNING AFTER ICE OR WIND STORMS

By J. J. LEVISON

WINTER storms often leave thousands of trees in mutilated condition and spur owners and responsible agencies to rush to their aid. This aid, however, is usually applied spontaneously to meet immediate demands — to clear roads, and to free the trees from dangerous and broken limbs. There is no time to give thought to the future of the trees themselves. While this is a general statement, the ice storm of March 4 last year, which damaged hundreds of thousands of trees in the vicinity of New York, may be taken as a concrete example. In this storm the trees were not up-rooted, as was the case during the hurricane that swept through the New England States on September 21, 1938. The damage was all in the branches. Many of the branches were completely ruined and had to be entirely cut off. Some were left hanging in dangerous positions and others remained untouched. There was so much cutting to be done at one time throughout the stricken area that private owners and city officials responsible for trees did not have sufficient skilled labor or funds to do any more pruning than was absolutely necessary for the moment. As a result, they confined themselves to the removal of dangerous and broken branches, leaving the rest of the tree untouched. This type of pruning left many trees extremely one-sided, with open tops and with heavy branches projecting beyond the main body of the crown. The result was lopsided and thin trees which did not look right because pruning was not directed to insuring a healthy, compact, symmetrical crown.

The condition of these pruned trees will become worse in many respects as time goes on. The long projecting limbs will go on growing longer and heavier. They will eventually become victims of future wind and ice storms or will finally break of their own weight. The sparsity of the branches created by the ice storm has exposed the leaves to the drying effects of sunlight and wind much more than before

the ice storm, when the crowns were good and thick and every leaf helped to protect its adjoining leaf from excessive evaporation in the same way as the trees in the forest shield each other against the drying effects of sun and wind.

Under this type of inadequate pruning, the misshapen crowns will keep on developing in a misshapen manner beyond the point of picturesqueness, and unless corrected will prove particularly undesirable with shade trees bordering city streets or highways, where compact and uniform crowns are essential qualifications.

To correct these unfavorable tendencies, it is obvious that we must now go back to those trees where the pruning was confined to the mere removal of broken and

dangerous branches and do some more work. We must now cut back the long projecting limbs so as to give the others a chance to keep pace with them. We must curtail the crown so as to encourage a dense uniform growth and to form a compact crown able to resist excessive evaporation. Finally we must cut back the undamaged branches sufficiently to give every branch an equal start which eventually will develop into a crown typical of the species involved.

This type of pruning must be done slowly, with knowledge and good taste. It will cost more but is worth much more. Practically all our shade trees will respond to cutting back — some more rapidly than others. Silver maples, willows,



A beautiful white birch improperly pruned, — left one-sided, with hanging branches — a future menace

AMERICAN FORESTS

and poplars will stand severe cutting and will fill out more quickly. Sycamores, lindens, oaks, elms, locusts and tulip trees will respond to hard cutting whereas the sugar maple must be cut rather cautiously and kept compact at all times. The Norway and red maples will not respond as readily as the silver maple but will fill out just the same in due time.

It is not necessary to go into the details of the methods of proper pruning. This phase of the subject has been frequently discussed and can be found in almost any good book on the care of trees. Expert workmen who undertake the job of prun-

ing a tree know all about making a close cut, as nearly parallel with the trunk or other point of origin as possible; about slanting cuts and dressing the wounds to prevent decay and about undercuts to prevent ripping of the bark. In these days when people are so tree conscious, a knowledge of the fundamental principles of proper tree pruning is not only known to those whose business it is to do the actual work but even to the layman who owns a tree. The thing that I want to emphasize in this article is the type of special pruning that both the owner and the tree expert have frequently overlooked.

Regulation of Forest Harvesting Proposed by Oregon's Governor Sprague

BY JOHN B. WOODS

THIRTY-ONE years ago private forest owners and public forest administrators of five far western states came together in public meeting to discuss forest conservation problems and to seek a basis for cooperative effort in behalf of needed state and federal protection legislation. Each year since 1909 these groups have met in conference, their numbers augmented by representatives of expanding federal, state, and private forestry agencies. Between times these men applied, with marked success, the cooperative principle in which they believed. The result has been steady evolution of protection systems unique in America as an example of unified effort to protect a wonderfully complex ownership pattern of forests, under extreme hazard conditions, with a minimum of overlapping and a considerable degree of satisfaction to all concerned.

While emphasis naturally has been upon forest protection, the Western Forestry and Conservation Association has pioneered, as well, in seeking to promote wise use of western woodlands. In view of these facts, it was entirely fitting that Governor Charles A. Sprague, of Oregon, speaking before the thirty-first annual conference of this association, December 12, 13, 14, should have sounded a note of challenge to all other states, by advocating prompt enactment of sensible forest harvesting practice rules to be applied upon private lands.

Forestry, said Governor Sprague, must be maintained upon a practical, not a romantic basis. Freshly clear-cut forests may shock some of us, while newly harvested wheat fields do not. Wheat stubble means to us loaves of bread and fattened stock, and there is the assurance of future crops. "Stump stubble" should similarly mean new homes, structures for human use, newspapers, and even clothing. And certainly we must insist upon future tree crops for our people. As our states have attacked the primary problem of protecting these forests, old and young, by enacting laws to regulate their use in time of fire hazard, so should they now move forward to the enactment of laws which will assure restocking. After years of trial the forest owners and operators, with advice of state and federal officers,

have formulated a forest practices bill which will be presented by the Governor to the 1941 Oregon Legislature. And it is expected to pass.

President G. F. Jewett, in opening the three-day meeting, pointed out that in the Far West, forest and related resources are adequate to carry on our timber economy in a sustained condition for several decades, living on our fat, so to speak. If we manage wisely, we can carry on permanently and with some expansion. And given reasonably wise management, we need no such regimentation or enforced direction of our daily lives as is common in the less fortunate countries of the Old World.

Speaking under the general heading of policies and plans, public and industrial, affecting cooperative relations in forest land management, G. H. Collingwood, forester for the National Lumber Manufacturers Association, outlined the program now being formulated by the regional lumber trade associations of this country. This program is predicated upon an acknowledged condition of nearly balanced growth and drain, and a rapidly growing application of essential forest management principles to private lands. As regulation of cutting practices becomes necessary and is accepted by the people of the several states, it should be devised by the interested groups, designed along tried, sensible lines, and put into effect by state authority.

Lyle F. Watts, regional forester, U. S. Forest Service, expressed his conviction that the forest problem is chiefly with forest lands in private ownership. While the growth and drain equation is balanced in some regions and woefully unbalanced in others, the fundamental concern of the Forest Service is with human problems. The aim is to assure stability and security for dependent forest families and com-

(Continuing on page 41)



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Association Board Holds Fall Meeting

At its regular fall meeting, held November 15, the Board of Directors of The American Forestry Association gave consideration to two bills pending in Congress relating to the public lands. One of them would give the President authority to transfer by proclamation lands in the national forests and the national parks to the War or Navy Departments for national defense purposes. The authority granted would be exercisable by the President when the lands are certified to him by the Secretary of War or the Secretary of the Navy as necessary in carrying out the national defense program. The President's authority to make such transfers would be only during the period of effectiveness of the Selective Training and Service Act of 1940 and the transfers would be for the duration of the emergency. The proposal is contained in companion bills S. 4404 and H. R. 10632.

Recognizing that national defense needs must have first priority, the Board nevertheless felt that an amendment to the bill would be desirable in order to assure that inroads upon the forests and parks are not made without consultation and agreement with the Secretaries of Agriculture or Interior, as the lands involved may concern. It was felt that before drawing upon these resource reservations for large areas that may be subjected to destructive use, such as bombing and tank training fields, there should be no question that other suitable areas are not available. The position of the Board was expressed in the following minute:

"We believe that S. 4404 and H. R. 10632 should be amended to provide that the Secretary of War or Secretary of Navy before certifying areas to the President for transfer shall consult with the Secretary of Agriculture or Secretary of Interior, as the case may be, to assure that other suitable areas are not available, the selection of which would avoid or minimize destruction of valuable resources.

"We furthermore believe that the national parks, preserving as they do irreplaceable natural treasures, should not be requisitioned under this act except in cases of dire emergency."

The other bill was H. R. 9351, introduced in the House by Representative De Rouen of Louisiana, and later in the Senate by Senator Adams of Colorado, S. 3827. The purpose of this bill is to amend

the American Antiquities Act of June 8, 1906, by repealing Section 2 thereof under which national monuments are established and substituting a new section that would give the President power to create by public proclamation "national recreational areas" on unreserved and unappropriated public lands when in his judgment they contain outstanding scenic or other natural features of national significance and are valuable for recreation. Such areas upon creation would be administered by the Secretary of the Interior through the National Park Service, and



Frank E. Mullen

the Secretary would be authorized to permit hunting, prospecting and mining within their boundaries. In view of the fact that the use of public lands for recreation is already provided for under the national forests, national parks and national monuments acts, the Board questioned the need of another type of reservation and voted its opposition to the bill in question by passage of the following minute:

"In the absence of any clear showing of need for the type of reservation proposed by H. R. 9351 and S. 3827, and in the belief that the amendment proposed would be prejudicial to national monu-

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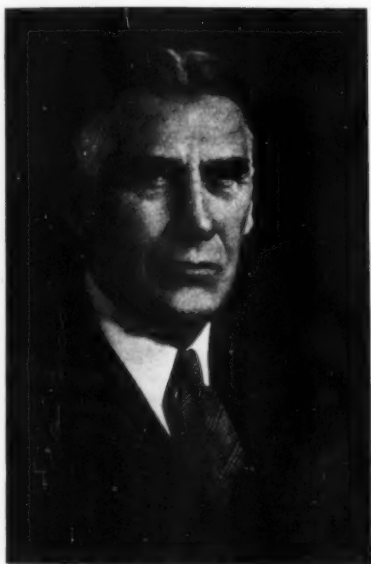
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ments as contemplated by the Antiquities Act of June 8, 1906, and further would disorganize the administration of public lands dedicated to forests, parks and national monuments, the Board of Directors disapproves bill H. R. 9351."

The Board accepted the resignation of Mr. Vanderbilt Webb as a director and named Mr. Frank E. Mullen, vice-president and general manager of the National Broadcasting Company of New York, to serve in his place until the next regular election of Association officers. Mr. Webb's retirement was forced by an illness that has made it necessary for him to give up many of his activities. Mr. Mullen, an outstanding figure in the radio field, is well known to foresters and other conservationists. A student of forestry at Ames, Iowa, he interrupted his college course to enlist in the U. S. Army and served overseas in France as a private and bugler of the Twentieth Forest Engineers.



F. W. Besley

Upon his return after the war, he completed his college course at Ames and then became a pioneer radio editor, organizing and conducting the first regular radio broadcast service for farmers. Later he included regular weekly broadcast service for conservation.

Retiring from the Board at the expiration of his present term, December 31, 1940, Mr. Fred W. Besley, state forester of Maryland, was made an honorary member of the Association by the Board. This action was in recognition and appreciation of his long service. Mr. Besley has served as a director for eighteen years.

Regulation

(Continued from page 39)

munities everywhere. And that does not write off, by any means, the great need for a prosperous lumber industry. This is all a cooperative undertaking. The federal government must help with funds for protection from fire, insects and disease, and other aids. And the public must be secured by some definite assurance that reasonable harvesting practices will be applied to lands receiving benefit of such aids.

Referring specifically to the Olympic National Park, Preston P. Macy, superintendent, presented the viewpoint of the Interior Department regarding the development of the national park system.

W. H. Horning, administrator of the O and C Lands, presented a progress report upon that enterprise. The organization problems and the technical ground work are now well on the way to solution. Significant progress is being made in efforts to apply slash burning techniques which will save the maximum of residual tree growth.

Extremely interesting was the topic "Relation of Forest Production and Use to National Defense." George P. Melrose, of the British Columbia Forest Service, summarized the experience and outlook in western Canada as follows:

The relation of forest production and use to national defense is: First, to supply the urgent, existing need for forest products. This is being done efficiently through the commercial organizations. Second, to delve more deeply and exhaustively into the entire problem of additional and derived products of wood. Third, to keep open and constantly broaden the market-channels between production and use, and fourth, to manage our forest estate wisely and protect it adequately.

Colonel W. B. Greeley, describing the situation in Oregon and Washington said: "As in the first world war, the great bulk of the lumber required is in the everyday building items It is interesting to note, however, that for all the developments in metallurgical craftsmanship and in the assembly-line type of mass production, modern war has need for the technical qualities of high grade and specialized types of lumber These are constantly changing Another striking fact in the supply of military needs as we know them today, is the necessity for having substitute materials ready to replace a preferred material, when it becomes short in supply or more essential for some other purpose All of which simply points to the obvious lesson that for national defense even more than for present

(Continuing on page 48)

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CHINA'S ANIMAL FRONTIER, by Clifford Pope. Published by the Viking Press, New York City. Illustrated. 192 pages. Price \$2.50.

Mr. Pope has written a story of his adventures in eastern China hunting mammals, fishes, amphibians and reptiles for the American Museum of Natural History. As head of one party, he migrated into remote recesses of the country and experienced many interesting encounters with the natives as well as with the animals he set out to capture.

THIS AMAZING PLANET, by Roy Chapman Andrews. Published by G. P. Putnam's Sons, New York City. 231 pages. Price \$2.00.

A potpourri of curious items about animals, about scientific misconceptions and discoveries, about strange and mystifying happenings—all these things and many more Dr. Andrews has picked up in his many trips of exploration all over the world and held carefully in his mental store-house pending his setting them down in this fascinating little book. Open it any place, at any time, with complete confidence in its interest.

THE DEVELOPMENT OF THE COOPERAGE INDUSTRY IN THE UNITED STATES, by Franklin E. Coyne. Published by the Lumber Buyers Publishing Company, Chicago, Illinois. 110 pages, illustrated. Price \$2.00.

The actual beginnings of this industry are lost in antiquity, for the ancient Babylonians and Egyptians made and used wooden barrels before the time of recorded history, but Mr. Coyne gives here a completely interesting account of this ancient industry in modern times, tracing from its general development in the United States beginning with John Alden, in 1620, a cooper on the "Mayflower," to the year 1940. A book to read.

TROPICAL FRUITS FOR SOUTHERN FLORIDA AND CUBA AND THEIR USES, by David Sturrock. Published by the Arnold Arboretum, Jamaica Plain, Mass. 131 pages. Price \$1.25.

Giving data on the cultivation, propagation and care of nearly 125 species of fruit-bearing trees and shrubs from the tropics of both hemispheres, special information is also included on the various fruits and their uses, as well as the preparations of jellies, jams, preserves and fruit pastes in this interesting little volume.

GROWING PLANTS WITHOUT SOIL, by D. R. Matlin. Published by Chemical Publishing Company, Inc., New York City. 137 pages. Illustrated. Price \$2.00.

Students, horticulturists, and hobbyists interested in plant chemiculture will find in this book thorough instructions and much practical information pertaining to the science of cultivating plants with the use of synthetic plant hormones.

NEW BOOKS *and*



OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

ANIMALS IN ACTION, by Gayle Pickwell. Published by Whittlesey House, McGraw-Hill Book Company, New York City. 190 pages, illustrated. Price \$4.00.

Another of the Gayle Pickwell oversized, beautifully illustrated books, but this time dealing with the active life of all kinds of animals. He tells of their homes; their activities as parents and in securing food; the young growing up, their methods of self-protection and their relation to other animals and, in a very interesting last chapter, he shows how entertaining a hobby the study of animals may become. Author and photographer, Gayle Pickwell is professor of zoology at the San Jose State College.

GREAT WINGS AND SMALL, compiled by Frances E. Clarke. Published by The Macmillan Company, New York City. 332 pages. Price \$2.50.

This is a collection of twenty-nine bird stories by famous authors and naturalists—John Burroughs, Thomas Bailey Aldrich, John Muir, Mark Twain, Archibald Rutledge, Arthur Newton Pack, Jack Miner, and Lorine Letcher Butler, to mention only a few,—and they are stories with appeal for old and young readers.

WILD BIRD NEIGHBORS, by Alvin M. Peterson. Published by The Bruce Publishing Company, Milwaukee, Wisconsin. Illus. 283 pages. Price \$2.00.

On the pages of this interesting little book the bird lover will have glimpses into the nests and family lives of thirty-five North American birds. Here the author presents firsthand information, obtained from his own keen observations, concerning the habits and characteristics of the cuckoos, nighthawks, thrashers, bluebirds, tanagers, and wood pewees—among others. The illustrations are excellent.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Review and Discussion of Literature Pertinent to Crop Rotations for Erodible Soils, by C. R. Enlow, Soil Cons. Ser., Dept. of Agr. Supt. of Docs., Wash., D. C. Price 10 cents.

Our National Resources, by the National Resources Planning Board. Supt. of Docs., Wash., D. C. Price 10 cents.

Forest Resources of the Northern Coastal Plain of North Carolina, by J. W. Cruikshank. For. Sur. Release 5, Appalachian For. Expt. Sta., Asheville, N. C.

Yellowstone Through the Ages, by Arthur D. Howard. Published by Columbia University Press, 2960 Broadway, New York City. Price 50 cents.

The Teacher Looks at Conservation, by Ollie E. Fink. Issued by The Ohio Division of Conservation and Natural Resources, in cooperation with The State Department of Education, Columbus, Ohio.

South Carolina State Parks. Compiled by the Writers Program, W.P.A., So. Car. The State Forest Service, Columbia, S. C.

Mechanization in the Lumber Industry, by Alfred J. Van Tassel and David W. Bluestone. Federal Works Agency, W.P.A., 1734 New York Avenue, N. W., Wash., D. C.

Fire Control Notes. Div. of Fire Control, For. Service, Vol. 4, No. 3. Supt. of Docs., Wash., D. C. Price 15 cents.

Farms The Rains Can't Take, by Kenneth Davis. Soil Cons. Serv., Misc. Pub. 394. Supt. of Docs., Wash., D. C. Price 5 cents.

Forest Statistics for Washington County, Oregon. Forest Service, U. S. Dept. of Agr. Pacific Northwest For. and Range Expt. Sta., Portland, Oregon.

Pacific Northwest Resources in Outline. Published by the Northwest Regional Council, Portland, Oregon. Price 25 cents.

Forest Depletion in Outline. Published by the Northwest Regional Council, Portland, Oregon. Price 25 cents.

Soil Conservation in Outline. Published by the Northwest Regional Council, Portland, Oregon. Price 25 cents.

Conservation of Wildlife. Hearings before the Select Committee on Conservation of Wildlife Resources, House of Representatives, Seventy-sixth Congress, third session, pursuant to House Res. 65. Supt. of Docs., Washington, D. C.

The Southern Forests—A Report on Resources. National Resources Planning Board, New Postoffice Building, Atlanta, Ga.

Silvicultural Research Operations, 1939-1940. Sil. Note No. 64, Dominion For. Br., Canada Dept. of Mines and Resources, Ottawa, Can.

Andorra Hand-Book of Trees and Shrubs, Andorra Nurseries, Inc., Chestnut Hill, Pa. Price \$1.00.

AMERICAN FORESTS

SCIENCE AND EQUIPMENT

MOTOR TOBOGGAN

Of definite interest to woodsmen, forest rangers, and lumbermen is the announcement of the Four Wheel Drive Auto Company of a new, perfected mechanized toboggan. The new vehicle is designed for operation in regions that were previously accessible only by skis, snowshoes or dog team. Speeds up to forty miles an hour are possible over unbroken winter trails.

Known as the Eliason Motor Toboggan, this versatile conveyance will travel over all types of snow and ice condition, will climb steep grades and haul heavy loads. Experimental machines have been in operation for ten years.

It is propelled by an endless belt that is driven by a twenty-five horsepower air-cooled engine. It is simple and easy to operate. The engine is started with a foot pedal. The clutch and shifting levers are similar to the clutch and shifting lever of an automobile, and are operated in a similar manner. Steering is accomplished by moving a steering lever located at the driver's seat which actuates runners under the front of the toboggan.

WHEELBARROW DUSTER

D. B. Smith and Company, makers of the famed Indian fire pump, are now offering a traction wheelbarrow duster in two sizes, one with a hopper capacity of from twelve to fifteen pounds and the other with a capacity of from ten to twelve pounds. They are especially built for dusting fruit and ornamental trees, flowers, shrubbery and many types of garden vegetables. They handle insecticide dusts and the patented features of these dusters embrace the feeding, mixing and distributing features. An adjustable feed gauge controls the amount of dust and a special blower unit made out of heavy gauge copper is designed to resist rust and corrosion. One steel wheel with welded spokes and large pneumatic tire is similar to a bicycle wheel but is designed for particularly rough use with little effort.

FIGHTING FIRE WITH ICE

Since Stewart H. Holbrook's fire fighting story appeared in the *Saturday Evening Post* in June, 1939, many readers have wanted to know more about "fighting fire with ice." A statement received from the Stanley Knight Corporation points out that "Dry Ice" is solid CO₂ that formerly was available only in liquid form and had to be transported under Interstate Commerce Commission approved cylinders. CO₂ fire extinguishers were costly to refill.

This is all changed now with solidification of CO₂ gas. It is transported wrapped in paper like a loaf of bread. It sells for an average three cents a

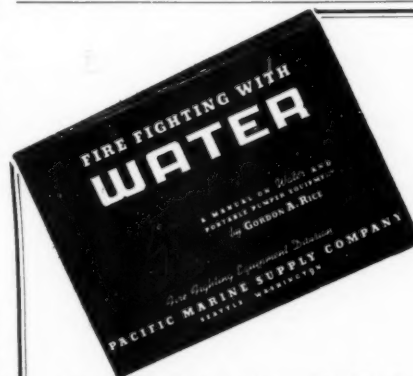
pound, or six to eight times cheaper than liquid CO₂. The U. S. Naval Air Stations use dry ice and convertor cylinders for filling their CO₂ fire extinguishers. The Forest Service uses the same cylinder for boosting the water pressure in their "chemical truck" or water tanks. Oil refineries have adopted the same convertor and dry ice system for fire protection and thousands of others have likewise switched from the old to this new method.

Strange as it may seem, CO₂ is first reclaimed from coke, or smoke or cement, or a thousand other products. It is purified and compressed into liquid form. Then, by spraying it into a "snow press" fifty per cent solidifies into a snow. It is then pressed into a 10x10x10 block, wrapped in paper and transported as fifty pounds of solid CO₂.

HOSE ACCESSORIES

Two new forest fire fighting accessories are announced by Pacific Marine Supply Company. One is the new high pressure control Siamese valve providing each hose outlet with a separate shut-off handle and valve. Working pressures up to 6,000 pounds are easily handled by the new valve.

When thousands of feet of hose line have to be handled, rolling and laying the hose becomes a big problem. A new hose reel originally devised on the Superior National Forest has been perfected and placed on the market. Hose may be rolled from the coupling end or from the middle. The capacity of the reel is 100 feet of 1½-inch linen or fifty feet of 1½-inch cotton rubber lined hose.



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Finnish Relief Fund Grows

Since the last report on the fund for the relief of Finnish foresters incapacitated in the Finnish-Russian war, the following contributions have been received by The American Forestry Association and the Society of American Foresters, both of which are sponsoring the raising of funds.

Total to December 1 (Previously Reported)	\$190.00
Contributions Received Since December 1 by The American Forestry Association:	
Edward J. Meeman, Memphis, Tennessee	25.00
Grace J. Averill, New York City	20.00
H. H. Chapman, New Haven, Connecticut	10.00
Stanton G. Smith, Baltimore, Maryland	5.00
Katherine W. Burr, Washington, D. C.	5.00
James M. Howe, Daytona Beach, Florida	3.00
Betty Kingsbury, Auburndale, Massachusetts	1.00
Contributions Received Since December 1 by the Society of American Foresters:	
Besse Day, Washington, D. C.	20.00
Henry I. Baldwin, Concord, New Hampshire	5.00
W. H. Cummings, Columbus, Ohio	5.00
Thornton T. Munger, Portland, Oregon	25.00
Central States Section, Society of American Foresters	75.86
Philip G. Haddock, Berkeley, California	1.00
Total	\$390.86

The fund is being kept open for further contributions in view of the urgent need of many Finnish foresters and their families who suffered heavily in defense of their country. Approximately ten per cent of Finland's foresters were killed in action and in addition many were wounded or permanently disabled. Funds received from American contributors are being cabled periodically to Finland.

The Association is in receipt of a letter from Mr. Risto Solanko, Secretary of the Finnish Legation in Washington, expressing appreciation for the help Americans are rendering the foresters of his country. Mr. Solanko writes: "I have the honor to express to you my heartfelt thanks for the sympathetic attitude taken by American foresters towards their fellow foresters in war-torn Finland. This sympathy means for us a great moral support in a time when Finland has to rebuild after the devastation of the war that was forced upon it. All forces in Finland are now at work well knowing that much privation and little recompense will come until the economical strength of the people is restored. This tremendous task is rendered much easier for us when we have the knowledge of the practical and sportsmanly sympathy that is given us from abroad. I will be happy to inform the Finnish government of this new token of friendship which unites the two democracies—one great and powerful and one small and poor."

Contributions may be sent either to The American Forestry Association, 919 17th Street, Washington, D. C., or the Society of American Foresters, Mills Building, Washington, D. C.

Ancient Forest of the Pacific Northwest

(Continued from page 15)

Here there existed swamp-loving trees, strange animals, water-loving alligator-like creatures, semi-aquatic rhinoceroses, raccoons, long-legged wading birds. Other denizens of the lowlands sought shelter among the gnarled roots of the cypress, and in the shade of swamp ash, tupelo gums, and numerous other exotic trees.

Many of the logs brought to this country by the floods were stranded on dry ground as the water receded, but others were left to drift about in the open lakes and swamps. It is from these latter that the story of the past may be read. Beneath the waters of the swamps and lakes lay the chilled wastes of a lava plain. And below that another, and another, beyond reckoning. And it came again,—an earth-jarring outburst of hot liquid lava, steam, and poisonous gases. It spread wholesale ruin, death and destruction in its course, wiping out all living things in its path and submerging the logs that floated on water surfaces. The water saved them from burning. The heat and pressure of the lava stream sealed them against decay. Chemicals worked their way into the open cells and pores, and in

the course of time the logs became opalized.

Intermingled with them were the bodies of Apheles, the water-loving, short-legged rhino, the alligator types, and other fauna caught by the lava's flow. Here, over an area of thousands of square miles, lay an entire plane of life of that ancient period, buried and preserved by the agent that destroyed it ten million years ago.

Sun, wind and rain; all of the elements assaulted the face of the hardened lava flow and, in time, formed more soil. Plant life began to grow again. Living things cautiously began to re-inhabit the area. Thousands of years passed, and again the earth's belly rumbled and shook, and spewed up molten lava. Time and time again the cycle repeated itself, until 500 feet of basaltic plain accumulated above the lost forest trees of ten million years ago.

Over that long period of successive lava flows there occurred two major geologic events: elevation of the Cascade mountains, resulting in a "rain shadow" to the eastward, and the lifting of the old lava plain approximately 1,500 feet. Some-

thing like one million years ago, the snows and rains and frost year by year finally succeeded in wearing away the hard blanket of basalt covering that drowned forest of the Miocene period, revealing it in a wholly unfamiliar setting.

Where there had been swamps, a parched landscape of sage and rocky bluffs stretched to the banks of the Columbia river. Where there had been cypress and tupelo gums, there were only shrubby junipers and sage. Once there had been aquatic rhinos and an alligator clan; now there were horses, but without the second and third toes; elephants, but without lower tusks; deer and antelope, with newly-acquired horns; sloths and armadillos from South America; bison and bears from Asia.

Moropus, the clawed horse, was gone forever from the earth. Gone, too, was Aphelops, the rhino. Maturely developed descendants of the horses, camels, and elephants had survived the millions of years. Huge, sabre-tooth tigers, lions and packs of fierce wolves had evolved from the cat and dog tribes.

The lifting of the lava plain and the shutting off of abundant rain from the Pacific by the rise of the Cascade Mountains had changed the climate, so that many trees and animals drifted southward, or became extinct. The winters became longer and more severe. Arctic plants and animals—caribou, moose and musk-ox—began to filter into the country. It was the Age of Ice.

Huge ice cakes jammed the gorges of the Columbia, and most of the basin country was covered with ice. Several times the climate swung away from the extreme cold, with contrasting intervals of almost sub-tropical conditions. With the passing of the last advance of ice, the sabre-tooth tigers, the lions, camels and elephants of that period became extinct. Bison and antelope flourished, and man, Asiatic in type, appeared—probably having followed the route of animal migration across the Alaska land bridge. Being men, they were hunters, in need of flint-like material for their arrow and spear points.

They found the exposed stony material of the petrified forests. They found what is now called the Ginkgo forest in central Washington, and the lava-preserved logs of the amazing natural phenomenon that is the Grand Coulee. The Grand Coulee, awesome, mysterious scar from the past, is fifty-three miles long, two to five miles wide, and was formed in the Columbia Basin during the glacier period by the ice forcing the north rivers to a focal point near the now building Grand Coulee Dam, causing them to flow down the valley and erode through the basaltic strata of perhaps fifteen million years of time.

In this deathbed of the Ice Age was formed the famous Dry Falls, over which in ancient times flowed the Columbia and flood-waters from the rivers of the Okanogan and Canada, together with the residue of melting ice-caps; to crash with a flood-tide fifty feet high over the five and a half mile long brink. Over two and a half times the height of Niagara, and with eighty times the volume, it was the greatest waterfall the world has ever known.

Geologists estimate that the mighty cascade of turbulent water took between six and seven thousand years to grind out the Grand Coulee canyon, exposing to the curious eyes of the Twentieth Century the body mold and bones of Aphelops, the rhino, recently discovered in the basalt escarpment above Blue Lake; and the petrified logs of giant Sequoia, sweet gum, spruce, and other remnants of that forest of ten million years ago, still embedded in the basalt that preserved them, or represented them by a perfect lava mold.

The petrified forests of Washington are the only ones known to be buried in liquid lava. Elsewhere, fossilized forests occur in ancient muds; a few in volcanic ash.

Professor Beck, writing on the subject in a recent issue of "Northwest Science," comments: "There can be little doubt but that the (entombment) process was effected in the presence of standing water. Abundant water at hand seems to have served as a protective agent against the heat of the liquid lava, thus accounting for the preservation and immediate petrification of the trees. Less abundant water seems to have resulted in the production of tree molds only..."

"A plenitude of water seems to have been necessary for the chemical reaction setting free the quantities of siliceous gel which invaded the cell lumens of the trees entombed. To repeat, it seems that the water served the dual purpose, when abundant, of protecting the logs from combustion and of providing for their relatively rapid petrification."

It is estimated that there are from five to ten thousand logs in the Ginkgo preserve alone. Greater Ginkgo forest includes some 3,000 square miles, although isolated evidences of it occur beyond this zone in a northeast-southwest belt thirty miles wide and 150 miles long. Approximately one hundred and fifty logs are to be seen in one area of 320 acres. Four types of forest conditions are found: Rafts of prostrate logs; empty tree molds, both horizontal and erect; petrified blocks of chips; and complexes of roots, logs and stump crowns.

Forests occur at scattering intervals in from six to fifteen levels throughout liquid basalt flows, averaging a half-mile in depth. The lavas, known as the Columbia River series, make up one of the largest areas of this kind extant, covering 200,000 square miles and containing 1,000 cubic miles of lava.

It is estimated that fifty per cent of the forest—or about thirty-seven tree types—represents trees which no longer grow north of Florida. Their average diameter is above two feet: witness six-foot oaks, five-foot maples, four-foot red gums, five-foot walnuts, four-foot spruces, ten-foot sequoias. Logs up to 100 feet in length have been found.

Meanwhile, men of science continue to explore the stone forest of the Ginkgo area and the mold "forest" in the seab lands of the Grand Coulee; and tomorrow, or possibly next week, or next year, one of them may come upon a new link to the past which will deliver to the layman another ancient wonder at which to marvel.

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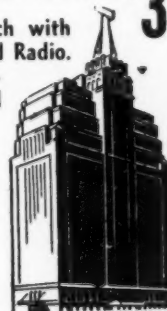
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A few recommended books on forestry and outdoor subjects are listed herewith. Prices quoted are not guaranteed, but to the best of our knowledge are correct. A more complete list of approximately 200 books will be mailed to you on request.

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Porcupine Wilderness

(Continued from page 9)

There are few rivers in the midlands of this country as completely wild and isolated as the Carp. From the place where it leaves Lake of the Clouds it winds for some ten miles down its broad valley before it turns abruptly to the north, breaks through the last of the mountains and goes booming down to Lake Superior in a succession of rapids and low waterfalls. Along all the length of the river, from Lake of the Clouds to Superior, there is not even a hunting shack. The Carp cuts its way mile after mile through parklike roadless forest, and many miles of its banks do not record a human footprint once a year. The few who venture along its course are lured by trout fishing of a brand that only roadless rivers offer.

A mile from its mouth another stream pours into Superior, the Little Carp, coming down from Mirror Lake, hidden in the same green hills of the Porcupines. The little river travels the same wild country and offers the same untutored and stout-hearted trout.

What is to become of this mountain wilderness? Is the largest tract of virgin hardwood left in the United States destined to meet the fate of heedless despoliation that has swept away, one after another, the bulk of the other big forests of the country and left desolation in the place of beauty, bankruptcy in the place of wealth?

These are questions to which conservationists—and I use the term to include hard-headed business men as well as dreamers who kneel at the shrine of wilderness wherever they find it—in many sections of the Lake States are seeking an answer.

Today the dual threat of logging and fire hangs over the Porcupine country like twin swords suspended by a single hair. When one falls the other will fall beside it. Lumbering operations are under way at many points around the edges of the tract. They gnaw deeper month by month. They await only the building of more roads to eat into the very heart of the big forest. In ten years they will leave the bulk of it just one more piece of outcrop.

No one wants to block outright and completely the cutting of this tract of timber. Much of it is ripe and ready for harvest. But the logging methods in vogue today among private timberland owners, the methods already in use along the margin of the Porcupine country, are the methods that have laid waste millions of acres of land in the Lake States. They leave in their wake a brand of ruin of which this country has seen far too much.

Should not the Porcupine forest be spared that fate? All around it, to the east, the west, the south, lie other tracts of outcrop. If proof is needed of the bankruptcy of such lands, plenty is available. Must the nation's biggest block of hardwood take that same road to ruin? The United States is spending millions of dollars—and will have to spend manyfold millions in the future—to rehabilitate out-crover lands from which the harvest was

taken too quickly and too wastefully. Is it sensible, is it sane business practice, to add the largest remaining hardwood area to the list eligible for dole?

Placed in public ownership and logged on a selective, sustained-yield basis this tract of timber would furnish lasting employment for a major share of the present population of the region, competent foresters say. It requires no great imagination to see what will happen to that source of employment if the timber harvest is completed in a decade or so. Plenty of examples of that are in the record.

Finally, there are sections of the Porcupine forest that should be spared permanently, sections that have values higher than the market price of their crops of sawlogs. The south shore of Lake Superior has no wilderness spots that outrank the wild gorges of the Black and the Presque Isle Rivers. The majestic timber that guards those gorges, the wilderness character that is their greatest charm, can be destroyed in a single winter of logging. Not in two centuries can such assets be replaced.

Michigan and many another state have proven over and over again that such scenic areas are too valuable to be lost. They are the core of a fast growing, profitable recreational industry. But private owners can hardly be expected to pass them by when logging crews are taking off the timber crop, or to donate them to the public. Such scenic spots in the Porcupines should be purchased as part of the entire tract, for permanent public ownership, and properly safeguarded when lumbering plans are drawn up.

No one suggests converting this great wilderness area into a park and "locking up" its timber resources. All that is urged is a wise harvest in place of wasteful destruction.

Individuals and groups living in the Porcupine country have urged for years the acquisition of this great timber tract as part of the Ottawa National Forest, within the boundaries of which it lies. The United States Forest Service would be delighted to gain possession of the tract and administer it.

For several years there has been before congress a measure known as the Hook Bill, which would appropriate \$10,000,000 for the purchase of the area. To date, however, this proposal has made little progress, and there seems scant reason to believe that it has any chance of ultimate passage. In the first place, the sum of money involved seems to be prohibitively large in the minds of congressmen from other districts. In the second place, bills appropriating funds for the purchase of forest lands in any designated section of the country are looked upon in Washington as "setting a bad precedent."

For no better reasons the death warrant of the Porcupine forest will finally be signed, unless a sufficient number of Americans intervene. What is needed as a first step, apparently, is a Save the Porcupines Association on a nationwide scale. After all, this beautiful tract of forest is the largest of its kind left in the nation. Is it not the nation's concern to

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see that it is protected and utilized in the wisest manner possible?

The conservationists, the forest lovers of America should cry out with one voice against the indiscriminate march of ax and fire through the roadless valleys of the Porcupines and across those wild mountain shoulders!

They say Americans never make the same mistakes twice. The story of the pine harvest is clear in the record. There is still time to avert a duplicate chapter.

Recuperating Americans

(Continued from page 12)

are responsible for the welfare and increase of the big game. Most states are doing a good job. The Pittman-Robertson Act passed by Congress in 1937 has greatly aided the states in carrying on wildlife conservation. This act authorizes the appropriation of funds derived from the federal excise tax on sporting arms and ammunition for carrying on wildlife restoration work. Appropriated funds are apportioned on the basis of area and the number of paid hunting licenses in each state, and participating states are required to bear twenty-five per cent of project costs. Projects for the restoration of game and nongame species have been started, and wildlife research on game management problems initiated. Thousands of acres have already been purchased for wildlife with these funds. In a few years many states will have restored numerous species of birds and mammals through this program alone.

To conservationists the present status of waterfowl and big game holds much hope for the future. Individuals, states, and federal agencies have brought most of these great species out of the red.

Truly, we have a great host of recuperating Americans that are proving excellent patients under the care of a public that is becoming a good doctor.

Regulation

(Continued from page 41)

time economy we should know our wood and what can be done with it. We need more, and still more, research on the technology of forest grown materials."

Resolutions adopted by the conference urged continuation of efforts to improve protection by organization and research, and particularly to present to each future conference the resolutions adopted by its predecessor.

[Officers of the Association elected for the ensuing year were: G. F. Jewett, Spokane, Washington, president; W. C. Lubrecht, Bonner, Montana; S. G. Moon, Boise, Idaho; C. B. Sanderson, Seattle, Washington; E. S. Collins, Portland, Oregon, and G. B. McCloud, San Francisco, California, vice presidents; E. T. Allen, forest counsel; C. S. Martin, secretary; C. S. Cowan, treasurer. The Standing Program Committee was appointed as follows: J. B. Woods, chairman; Norman Jacobson, W. G. Tilton, Stewart Moir, N. S. Rogers.—EDITOR.]

WHO'S WHO

Among the Authors in This Issue

BEN EAST (*Porcupine Wilderness*), outdoor writer and editor of Michigan, has long been a champion of conservation, and his plea here is for the protection and preservation of the last great remaining virgin hardwood tract—in a Michigan wilderness.



Ben East

LOGAN J. BENNETT (*Recuperating Americans*) is a native Missourian and wildlife expert. Attached to the United States Fish and Wildlife Service as a leader in the wildlife research work, first in Iowa and now in Pennsylvania, he is an authority on quail and waterfowl management. His book on the blue-winged teal was based on a field study requiring travel from Canada to southern Mexico—and his main hobby is training bird dogs.

CAMPBELL DAVIS (*An Ancient Forest*), virile biographer of our Northwest, writes from Yakima, Washington, a vivid tale revealing secrets of that region buried since the days "when the lava flowed."

W. C. LOWDERMILK (*Cedars of Lebanon—Then and Now*), soil erosion expert, is with the Soil Conservation Service. Widely known as a scientist and writer, his description of the Cedars of Lebanon and the part they played in the lives of an ancient people is of fascinating interest.

FLOYD W. SCHMOE (*The Forest and Men's Souls*), well known as a naturalist and lecturer on nature subjects, was formerly park naturalist on Mt. Rainier National Park in Washington.



E. G. Brewer

ERLE G. BREWER (*The Fight for the Elms*), in charge of Dutch elm disease eradication for the Federal Government, has been identified for years with plant pest control, doing outstanding work in this field.

HERBERT B. MCKEAN (*Beautiful Interiors of Wood*) specializes in forest utilization and teaches forestry at the Louisiana State University.

ROBERT ISAAC (*Mice and Conifers*) majored in agriculture at the University of Wyoming—lived through an interesting time during the depression of the late 20's and then associated himself with the Fish and Wildlife Service in various capacities. He is now in Montana—working on the control of predators and rodents.

THE COVER—The magic beauty of the Black Oaks of Yosemite in winter. Photograph by the National Park Service.

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